Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT3501

HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-27MP /XN/UC

This service manual should be used together with the following manual(s) listed below. For the parts numbers, adjustments, etc. which are not shown in this manual, refer to the following manual(s).

Model No.	Order No.	Mech. Module	Remarks
DEH-2750MP/XN/GS	CRT3396		
CX-3158	CRT3394	S10.1AAC	CD Mech. Module : Circuit Description, Mech. Description, Disassembly

SAFETY INFORMATION

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZW. JULY 2005 Printed in Japan

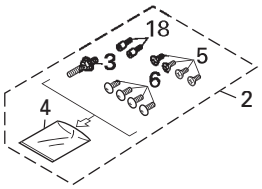
EXPLODED VIEWS AND PARTS LIST

PACKING(Page 8)

● **PACKING SECTION PARTS LIST**

* : Non spare part

Mark	No.	Description	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
	1	Accessory Assy	CEA4850	CEA4610
	2	Screw Assy	CEA3849	CEA4611
	10	Polyethylene Bag	CEG-162	CEG1173
	11	Carton	CHG5434	CHG5578
	12	Contain Box	CHL5434	CHL5578
	15-1	Owner's Manual	CRD3939	CRD4001
	15-2	Installation Manual	CRD3940	CRD4002
*	15-4	Caution Card	Not used	CRP1294
*	15-5	Card	Not used	ARY1048
	16	Case Assy	CXB3520	Not used
	18	Screw	Not used	CBA1488



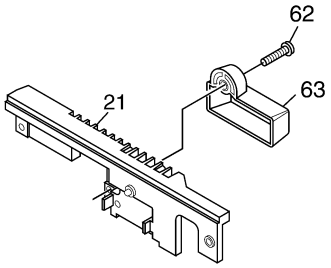
● **Owner's Manual, Installation Manual**

Part No.	Language
CRD4001	English, French, Spanish
CRD4002	English, French, Spanish

EXTERIOR(Page 10)

● **EXTERIOR SECTION PARTS LIST**

Mark	No.	Description	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
	9	Tuner Amp Unit	CWM9693	CWN1393
	36	Screw	IMS20P030FZK	IMS20P030FTB
	38	Detach Grille Assy	CXC3748	CXC5516(Grille Assy)
	39	Screw	BPZ20P100FZK	BPZ20P100FTB
	56	Grille Unit	CXC3643	CXC5479
	61	Panel	YNS5045	CNS8046
	62	Screw	Not used	BMZ40P140FTC
	63	Holder	Not used	CNV7619



ELECTRICAL PARTS LIST(Page 42)

TUNER AMP UNIT

Circuit Symbol and No.	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
IC601 IC	PE5447A	PE5523A
R151, 152	RD1/4PU471J	Not used
R153, 154	RS1/16S471J	RS1/16S0R0J
R353, 354	RS1/16S331J	RS1/16S821J

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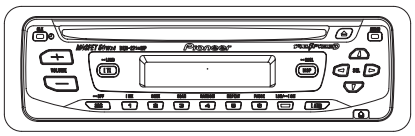
Service Manual



DEH-2790MP/XN/ID

ORDER NO.
CRT3396

HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-2790MP/XN/ID
DEH-2750MP/XN/GS
DEH-2770MP/XN/CS

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech.Module	Remarks
CX-3158	CRT3394	S10.1AAC	CD Mech. Module : Circuit Description, Mech. Description, Disassembly

For details, refer to "Important Check Points for Good Servicing".

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PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZA. NOV. 2004 Printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

● Service Precaution

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO TEXT

Designed for Windows Media™

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

CONTENTS

1. SPECIFICATIONS

● DEH-2790MP/XN/ID, DEH-2750MP/XN/GS

General

Rated power source ..... 14.4 V DC (allowable voltage range: 12.0 – 14.4 V DC)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Dimensions (W × H × D):
Backup current ..... 5 mA or less
DIN
Chassis ..... 178 × 50 × 157 mm
Nose ..... 188 × 58 × 18 mm
D
Chassis ..... 178 × 50 × 162 mm
Nose ..... 170 × 48 × 13 mm
Weight ..... 1.3 kg

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Maximum power output ..... 50 W × 4
Load impedance ..... 4 Ω (4 – 8 Ω allowable)
Preout max output level/output impedance ..... 2.2 V/1 kΩ
Bass/Treble:
Bass
Frequency ..... 100 Hz
Gain ..... ±12dB
Treble
Frequency ..... 10 kHz
Gain ..... ±12dB
Loudness contour
Low ..... +7 dB (100 Hz), +4 dB (10 kHz)
High ..... +10 dB (100 Hz), +6.5 dB (10 kHz) (volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
Sampling frequency ..... 44.1 kHz
Number of quantization bits ..... 16; linear
Frequency characteristics ... 5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9 (2ch audio)
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.5 – 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio ..... 75 dB (IEC-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo)
0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response ..... 30 – 15,000 Hz (±3 dB)
Stereo separation ..... 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range ..... 531 – 1,602 kHz (9 kHz)
530 – 1,640 kHz (10 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

● DEH-2770MP/XN/CS

General

Rated power source ..... 14.4 V DC (allowable voltage range: 12.0 – 14.4 V DC)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 × 50 × 157 mm
  - Nose ..... 188 × 58 × 18 mm
- D
  - Chassis ..... 178 × 50 × 162 mm
  - Nose ..... 170 × 48 × 13 mm

Weight ..... 1.3 kg

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Maximum power output ..... 50 W × 4
Load impedance ..... 4 Ω (4 – 8 Ω allowable)
Preout max output level/output impedance ..... 2.2 V/1 kΩ
Bass/Treble:
- Bass
  - Frequency ..... 100 Hz
  - Gain ..... ±12dB
- Treble
  - Frequency ..... 10 kHz
  - Gain ..... ±12dB

Loudness contour
- Low ..... +7 dB (100 Hz), +4 dB (10 kHz)
- High ..... +10 dB (100 Hz), +6.5 dB (10 kHz) (volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
- Sampling frequency ..... 44.1 kHz
- Number of quantization bits ..... 16; linear

Frequency characteristics ... 5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9 (2ch audio)
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.5 – 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio ..... 75 dB (IEC-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response ..... 30 – 15,000 Hz (±3 dB)
Stereo separation ..... 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range ..... 530 – 1,640 kHz (10 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

A

B

C

D

E

F

2. EXPLODED VIEWS AND PARTS LIST

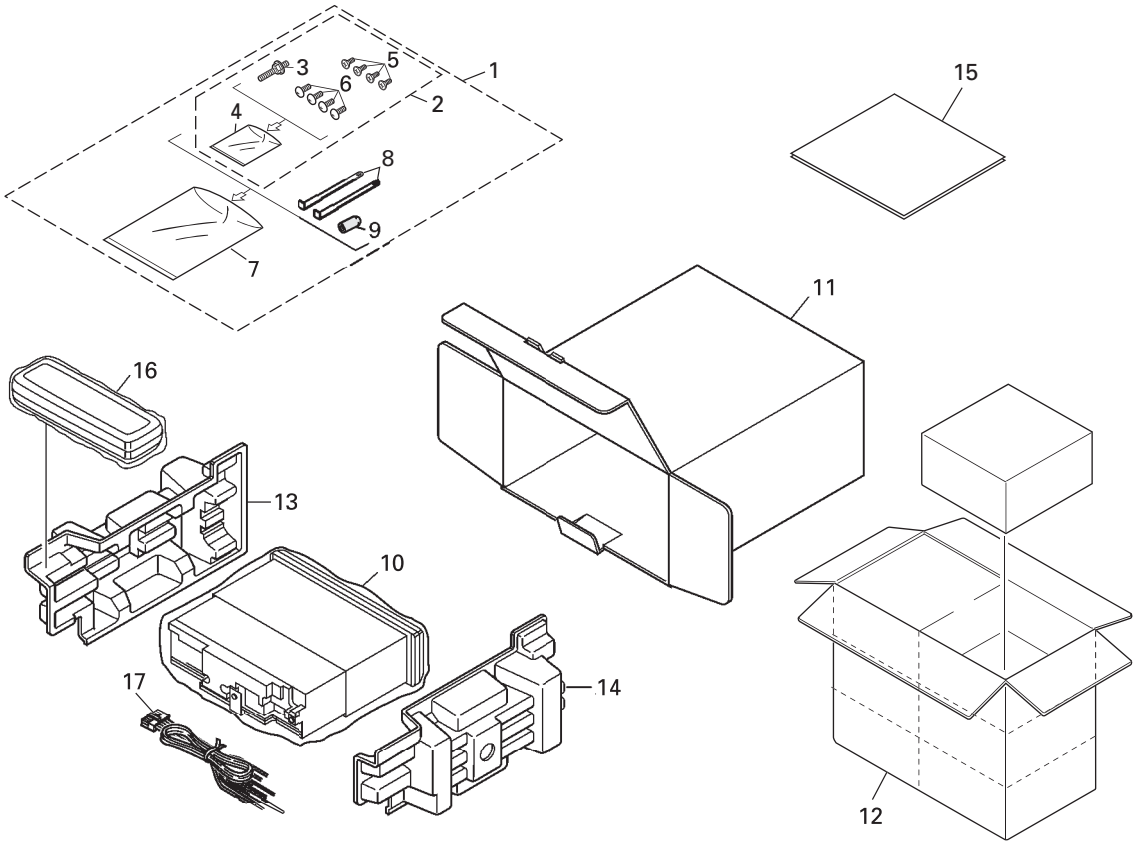
*NOTES : • Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*

• The ⚠ mark found on some component parts indicatesthe importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

• Screw adjacent to▽mark on the product are used for disassembly.

• For the applying amount of lobricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)

2.1 PACKING



(1) PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Accessory Assy	CEA4850
	2	Screw Assy	CEA3849
	3	Screw	CBA1650
*	4	Polyethylene Bag	CEG-127
	5	Screw	CRZ50P090FTC
	6	Screw	TRZ50P080FTC
*	7	Polyethylene Bag	CEG-158
	8	Handle	CNC5395
	9	Bush	CNV3930
	10	Polyethylene Bag	CEG-162
	11	Carton	See Contrast table(2)
	12	Contain Box	See Contrast table(2)
	13	Protector	CHP2664
	14	Protector	CHP2868
	15-1	Owner's Manual	See Contrast table(2)
	15-2	Installation Manual	See Contrast table(2)
	15-3	Caution Card	CRP1310
	16	Case Assy	CXB3520
	17	Cord Assy	XDE7008

(2) CONTRAST TABLE

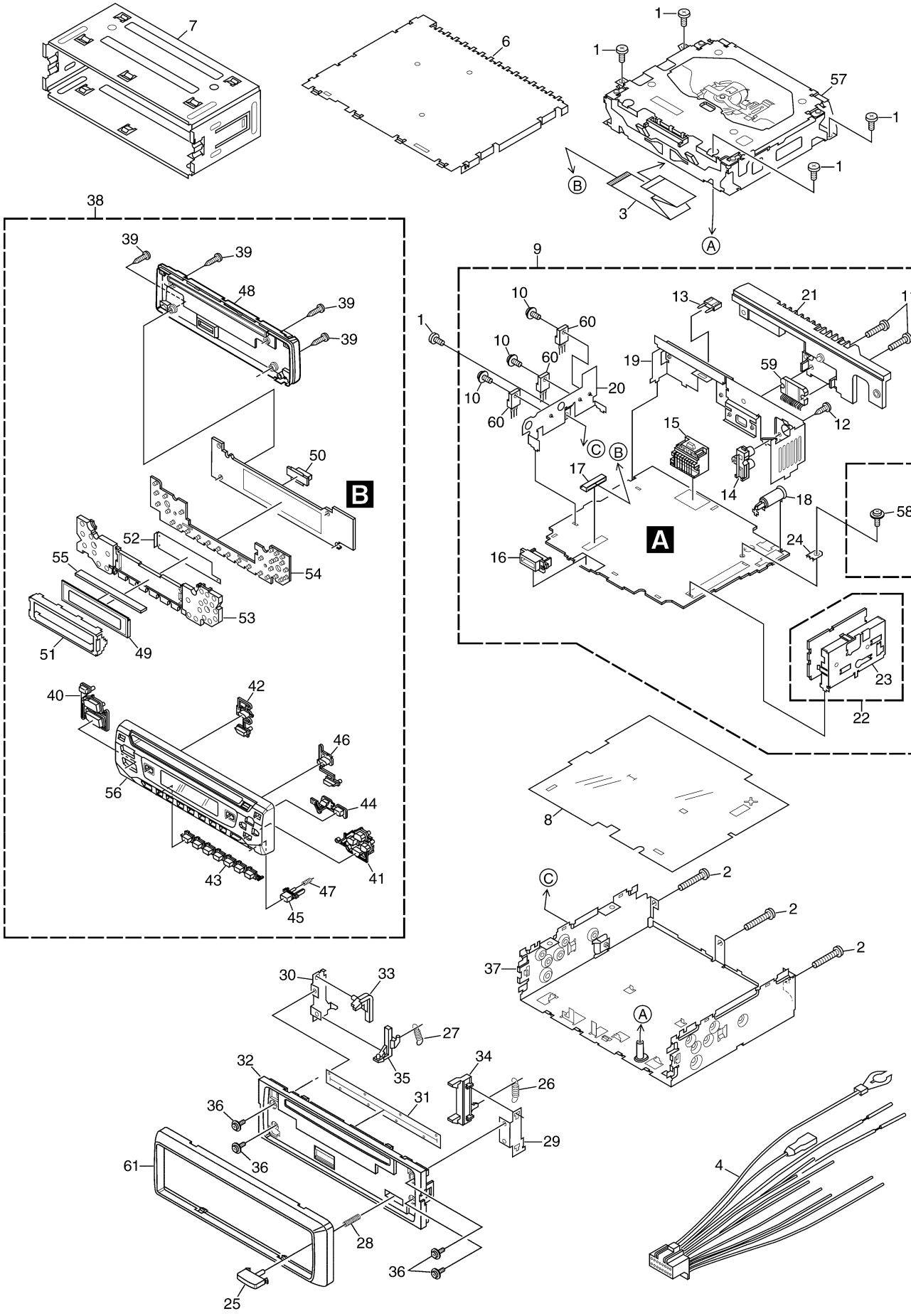
DEH-2790MP/XN/ID, DEH-2750MP/XN/GS and DEH-2770MP/XN/CS are constructed the same except for the following:

Mark	No.	Description	DEH-2790MP/XN/ID	DEH-2750MP/XN/GS	DEH-2770MP/XN/CS
	11	Carton	CHG5470	CHG5434	CHG5435
	12	Contain Box	CHL5470	CHL5434	CHL5435
	15-1	Owner's Manual	CRD3939	CRD3939	CRD3937
	15-2	Installation Manual	CRD3940	CRD3940	CRD3938

Owner's Manual,Installation Manual

Part No.	Language
CRD3939	English, Traditional Chinese, Arabic
CRD3940	English, Traditional Chinese, Arabic
CRD3937	English, Spanish, Portuguese(B)
CRD3938	English, Spanish, Portuguese(B)

2.2 EXTERIOR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(1) EXTERIOR SECTION PARTS LIST

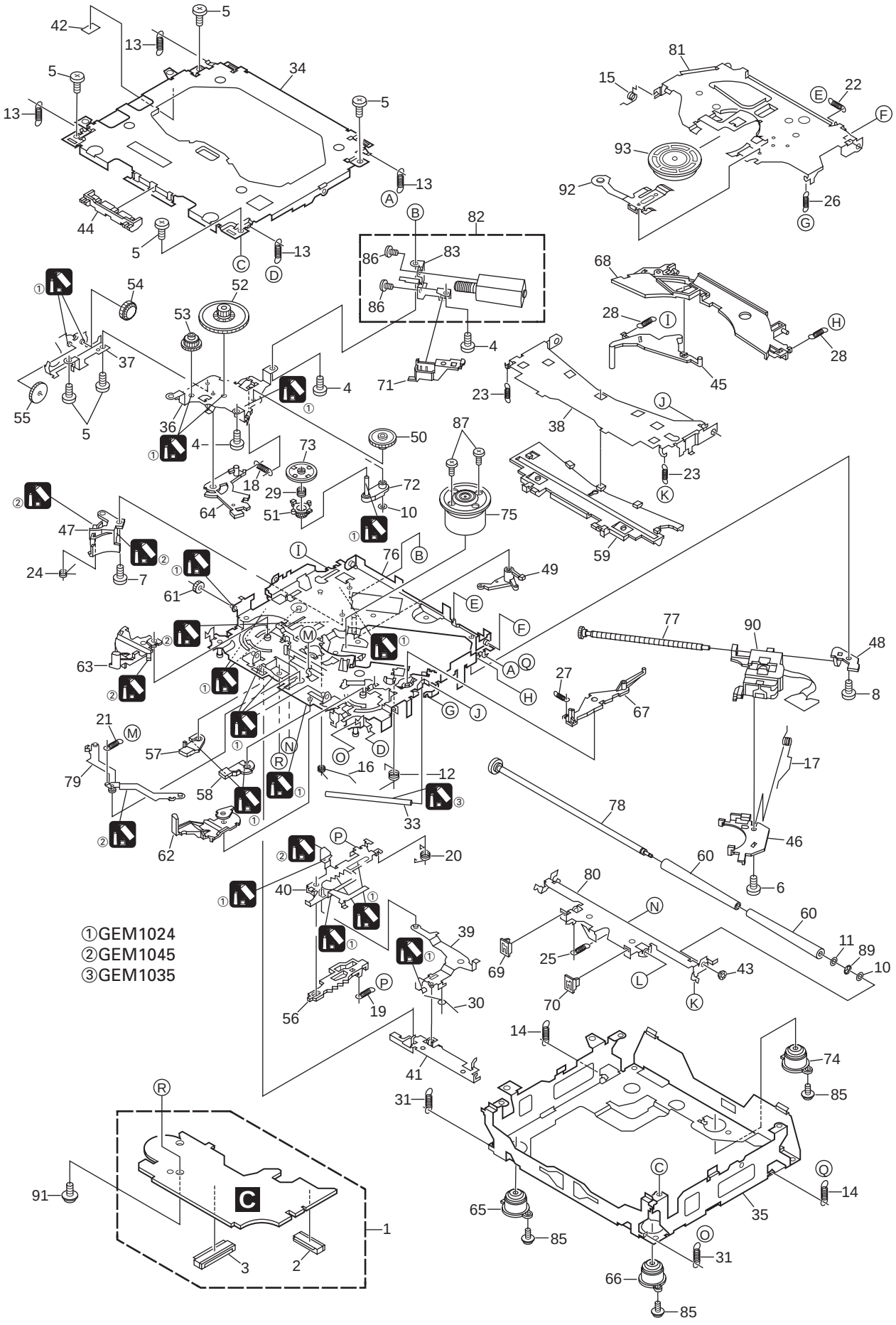
Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ26P100FTC
	3	Cable	CDE7703
	4	Cord Assy	XDE7008
	5	•••••	
	6	Case	CNB2793
	7	Holder	CNC8659
	8	Insulator	CNM9145
	9	Tuner Amp Unit	See Contrast table(2)
	10	Screw	ASZ26P060FTC
	11	Screw	BMZ26P160FTC
	12	Screw	BPZ26P080FTC
⚠	13	Fuse(10A)	CEK1208
	14	Pin Jack(CN352)	CKB1059
	15	Plug(CN901)	CKM1376
	16	Connector(CN831)	CKS3581
	17	Connector(CN651)	CKS3837
	18	Antenna Jack(CN401)	CKX1056
	19	Holder	CND2413
	20	Holder	CND2414
	21	Heat Sink	CNR1762
	22	FM/AM Tuner Unit	CWE1912
	23	Holder	CND1054
	24	Terminal(CN402)	VNF1084
	25	Button(DETACH)	CAC4836
	26	Spring	CBH1835
	27	Spring	CBH2208
	28	Spring	CBH2367
	29	Bracket	CNC6791
	30	Holder	CNC8042
	31	Cover	CNM6276
	32	Panel	CNS8044
	33	Arm	CNV4692
	34	Arm	CNV4728
	35	Arm	CNV5576
	36	Screw	IMS20P030FZK
	37	Chassis Unit	CXC3600
	38	Detach Grille Assy	See Contrast table(2)
	39	Screw	BPZ20P100FZK
	40	Button(TA, VOLUME(+/-))	CAC8924
	41	Button(UP, DOWN, LEFT, RIGHT)	CAC8926
	42	Button(BTB, SOURCE)	CAC8927
	43	Button(1-6, LOCAL/BSM)	CAC8929
	44	Button(EJECT, AUDIO)	CAC8930
	45	Button(DETACH)	CAC8931
	46	Button(DISPLAY, BAND)	CAC8934
	47	Spring	CBH2210
	48	Cover	CNS8042
	49	LCD	CAW1848
	50	Connector(CN1801)	CKS3580
	51	Holder	CND2412
	52	Sheet	CNM9144
	53	Lighting Conductor	CNV8190
	54	Rubber	CNV8191
	55	Connector	CNV8192
	56	Grille Unit	See Contrast table(2)
	57	CD Mechanism Module(S10.1AACA)	CXK5663
	58	Screw	ISS26P055FTC
	59	IC(IC302)	PAL007A
	60	Transistor(Q911, 921, 991)	2SD2396
	61	Panel	See Contrast table(2)

(2) CONTRAST TABLE

DEH-2790MP/XN/ID, DEH-2750MP/XN/GS and DEH-2770MP/XN/CS are constructed the same except for the following:

Mark	No.	Description	DEH-2790MP/XN/ID	DEH-2750MP/XN/GS	DEH-2770MP/XN/CS
	9	Tuner Amp Unit	CWM9693	CWM9693	CWM9970
	38	Detach Grille Assy	CXC4395	CXC3748	CXC4391
	56	Grille Unit	CXC4239	CXC3643	CXC4236
	61	Panel	YNS5045	YNS5045	CNS8048

2.3 CD MECHANISM MODULE

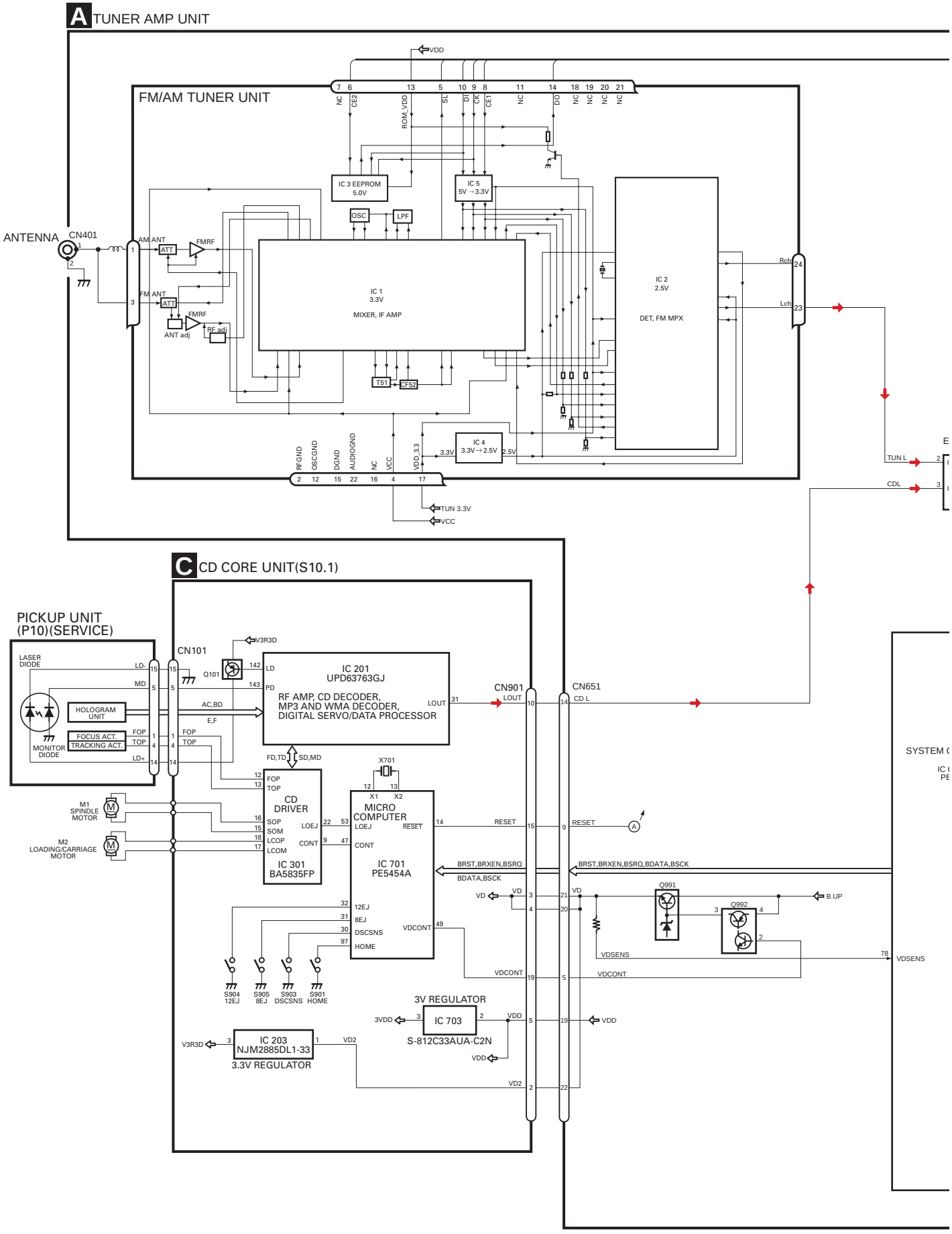


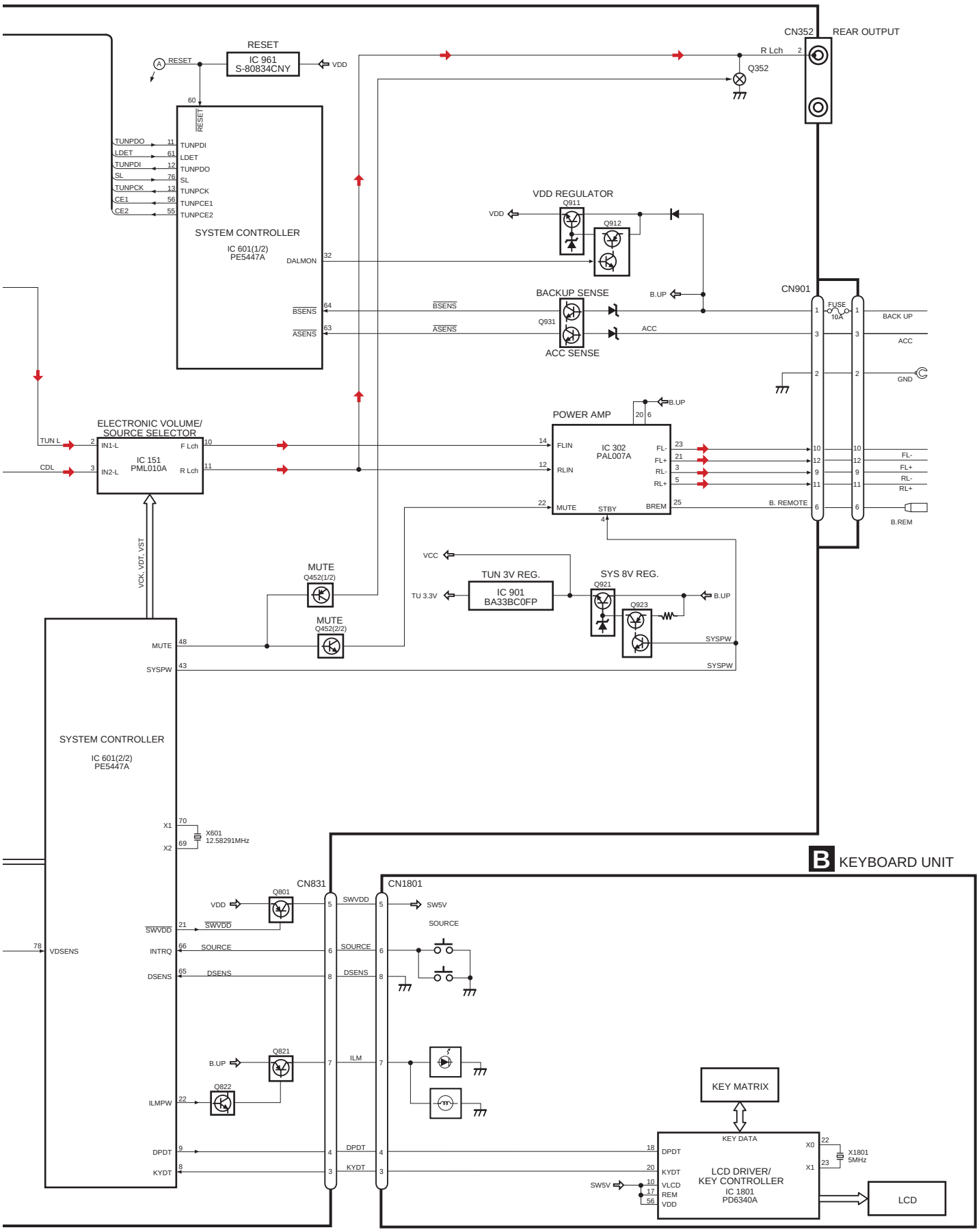
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.1)	CWX3096
	2	Connector(CN101)	CKS4182
	3	Connector(CN901)	CKS4017
	4	Screw	BMZ20P035FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2x4)	CBA1362
	7	Screw(M2x3)	CBA1824
	8	Screw(M2x3)	CBA1825
	9	•••••	
	10	Washer	CBF1038
	11	Washer	CBF1060
	12	Spring	CBH2390
	13	Spring	CBH2606
	14	Spring	CBH2607
	15	Spring	CBH2608
	16	Spring	CBH2609
	17	Spring	CBH2610
	18	Spring	CBH2735
	19	Spring	CBH2612
	20	Spring	CBH2613
	21	Spring	CBH2614
	22	Spring	CBH2615
	23	Spring	CBH2616
	24	Spring	CBH2617
	25	Spring	CBH2620
	26	Spring	CBH2621
	27	Spring	CBH2641
	28	Spring	CBH2642
	29	Spring	CBH2643
	30	Spring	CBH2659
	31	Spring	CBH2688
	32	•••••	
	33	Shaft	CLA4441
	34	Frame	CNC9962
	35	Frame	CNC9963
	36	Bracket	CND2712
	37	Bracket	CND1895
	38	Arm	CNC9968
	39	Arm	CND1909
	40	Lever	CND2032
	41	Lever	CNC9984
	42	Sheet	CNM8134
	43	Collar	CNV7798
	44	Guide	CNV7799
	45	Arm	CNV8403
	46	Rack	CNV8374
	47	Holder	CNV8376
	48	Holder	CNV8377
	49	Arm	CNV8378
	50	Gear	CNV8379
	51	Gear	CNV8380
	52	Gear	CNV8381
	53	Gear	CNV8382
	54	Gear	CNV8383
	55	Gear	CNV8384
	56	Rack	CNV8385
	57	Arm	CNV8386
	58	Arm	CNV8387
	59	Guide	CNV8388
	60	Roller	CNV7218
	61	Gear	CNV8389
	62	Arm	CNV8391
	63	Arm	CNV8390
	64	Arm	CNV8392
	65	Damper	CNV7313
	66	Damper	CNV7314
	67	Arm	CNV8394
	68	Arm	CNV8395
	69	Guide	CNV8396
	70	Guide	CNV8397
	71	Holder	CNV8398
	72	Arm	CNV8402
	73	Gear	CNV8400
	74	Damper	CNV7618
	75	Motor Unit(M1)	CXC4440
	76	Chassis Unit	CXC2318
	77	Screw Unit	CXB8729
	78	Gear Unit	CXC2397
	79	Arm Unit	CXC2316
	80	Arm	CND1896
	81	Arm	CND1894
	82	Motor Unit(M2)	CXB8933
	83	Bracket	CNC9985
	84	•••••	
	85	Screw(M2x5)	EBA1028
	86	Screw	JFZ20P020FTC
	87	Screw	JGZ17P022FTC
	88	•••••	
	89	Washer	YE20FTC
	90	Pickup Unit(P10)(Service)	CXX1641
	91	Screw	IMS26P030FTC
	92	Spring	CBL1635
	93	Clamper	CNV8372

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

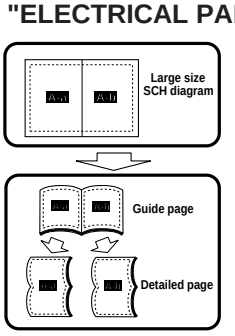
3.1 BLOCK DIAGRAM




RESET
IC 961
S-80834CNY
VDD
CN352
REAR OUTPUT
R Lch
Q352
SYSTEM CONTROLLER
IC 601(1/2)
PE5447A
TUNPDO
LDET
TUNPDI
SL
TUNPCK
CE1
CE2
TUNPCE1
TUNPCE2
DALMON
BSENS
ASENS
VDD REGULATOR
Q911
Q912
BACKUP SENSE
Q931
ACC SENSE
B.UP
ACC
CN901
FUSE
10A
BACK UP
GND
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 151
PML010A
TUN L
CDL
IN1-L
IN2-L
F Lch
R Lch
POWER AMP
IC 302
PAL007A
FLIN
RLIN
MUTE
STBY
BREM
FL-
FL+
RL-
RL+
B. REMOTE
B.REM
VCK, VDT, VST
MUTE
Q452(1/2)
Q452(2/2)
VCC
TUN 3V REG.
IC 901
BA33BC0FP
TU 3.3V
SYS 8V REG.
Q921
Q923
SYSPW
SYSTEM CONTROLLER
IC 601(2/2)
PE5447A
X601
12.58291MHz
B KEYBOARD UNIT
CN831
CN1801
Q801
SWVDD
SW5V
SOURCE
VDSENS
INTRQ
DSENS
Q821
Q822
ILM
ILMPW
DPDT
KYDT
KEY MATRIX
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC 1801
PD6340A
X1801
5MHz
LCD

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



NOTE :

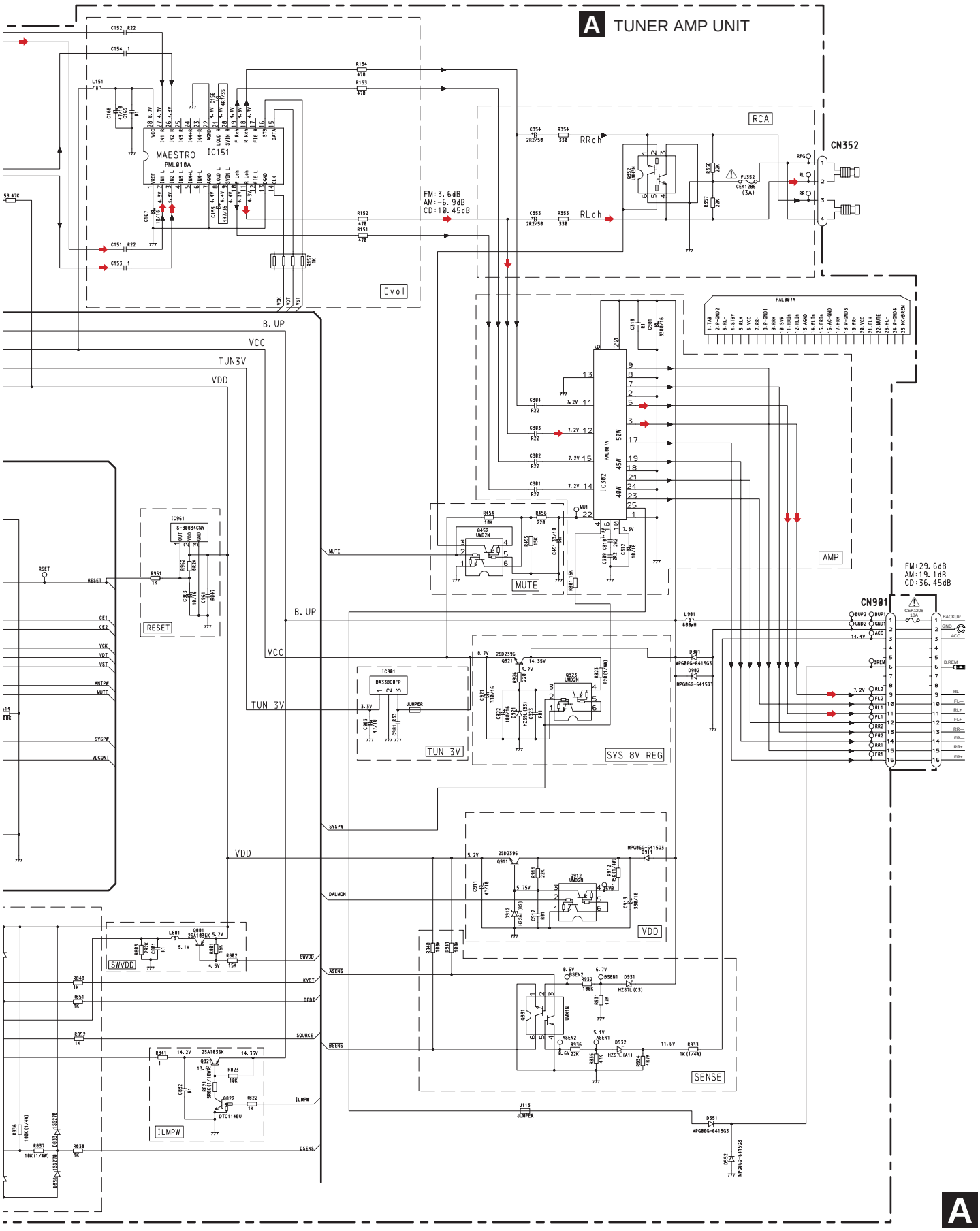
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

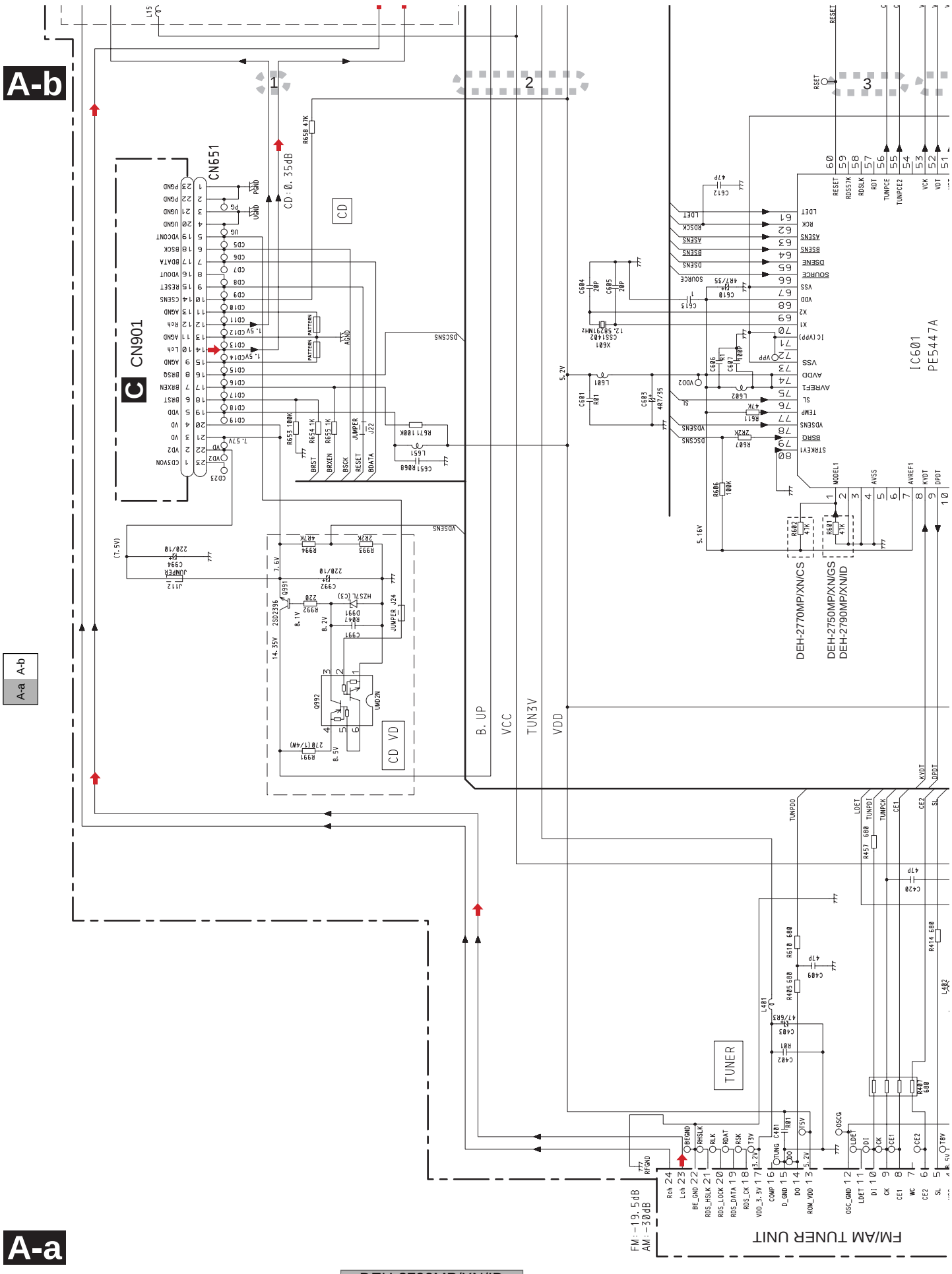
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

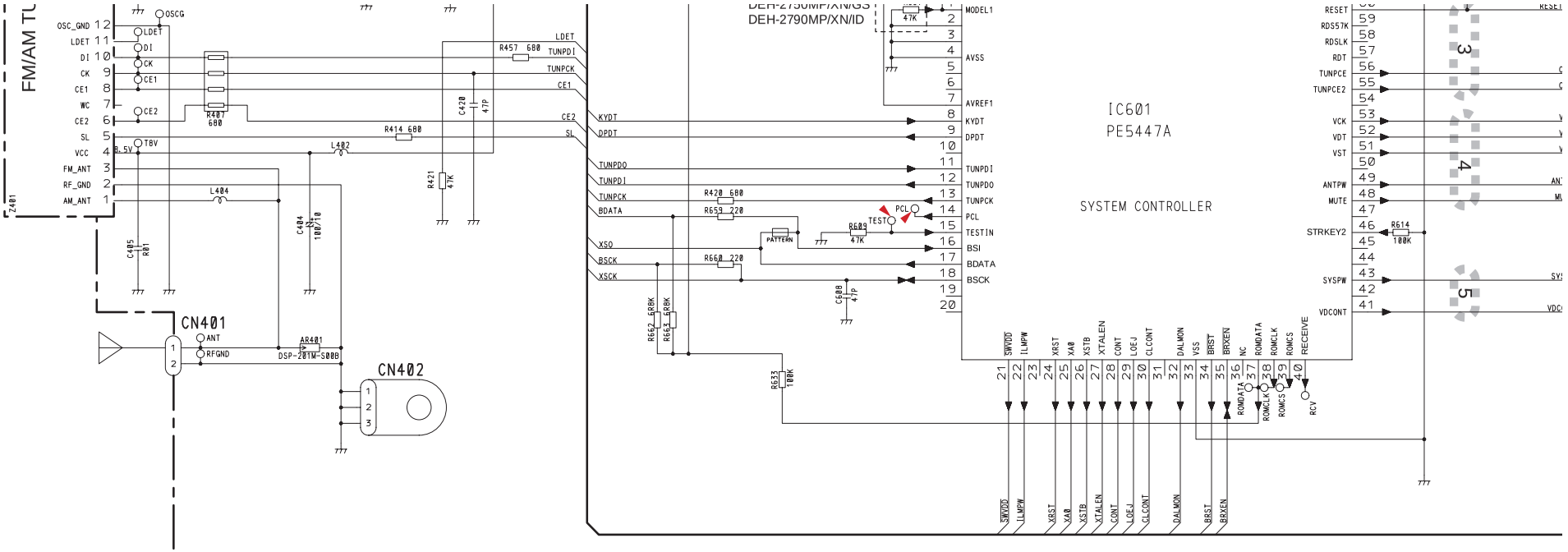
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

A-b

A TUNER AMP UNIT




A-b
A-a
CN651
CN901
CD
CD VD
B. UP
VCC
TUN3V
VDD
IC601
PE5447A
DEH-2770MP/XN/CS
DEH-2750MP/XN/GS
DEH-2790MP/XN/ID
TUNER
FM/AM TUNER UNIT
FM: -19.5dB
AM: -30dB



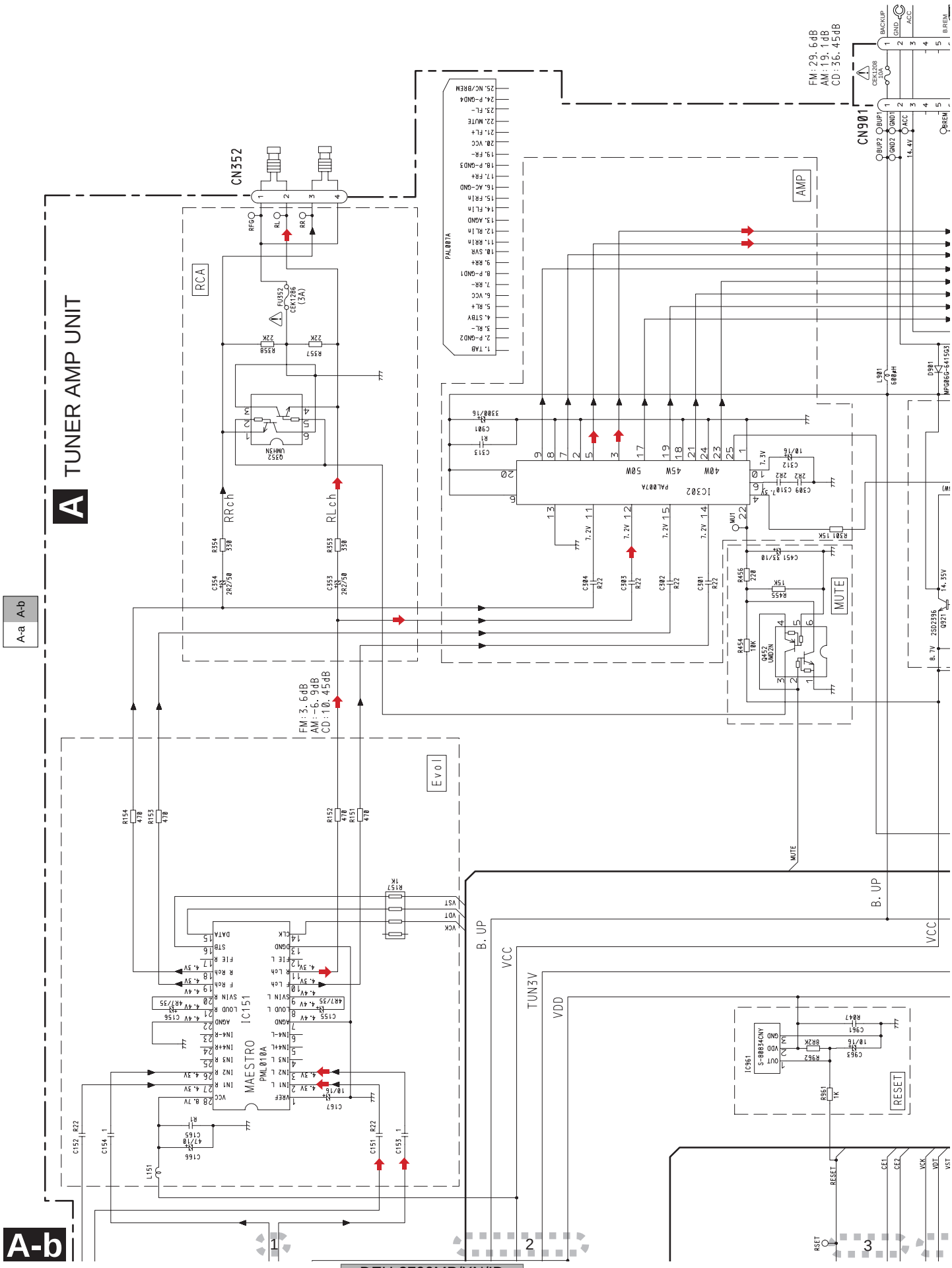
NOTE :

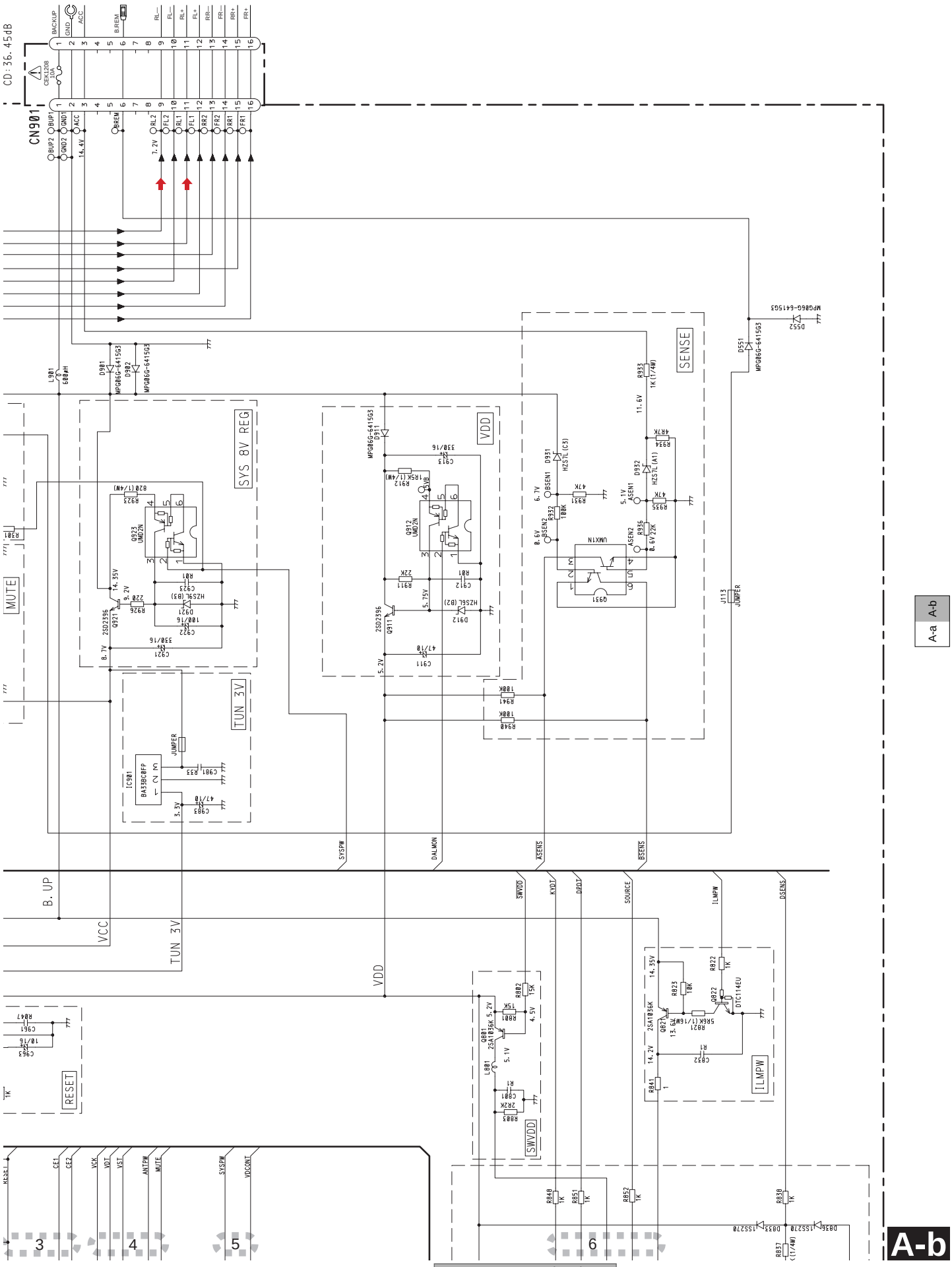
- ⊏⊐ Symbol indicates a resistor.
  No differentiation is made between chip resistors and discrete resistors.
- ⊣⊢ Symbol indicates a capacitor.
  No differentiation is made between chip capacitors and discrete capacitors.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.

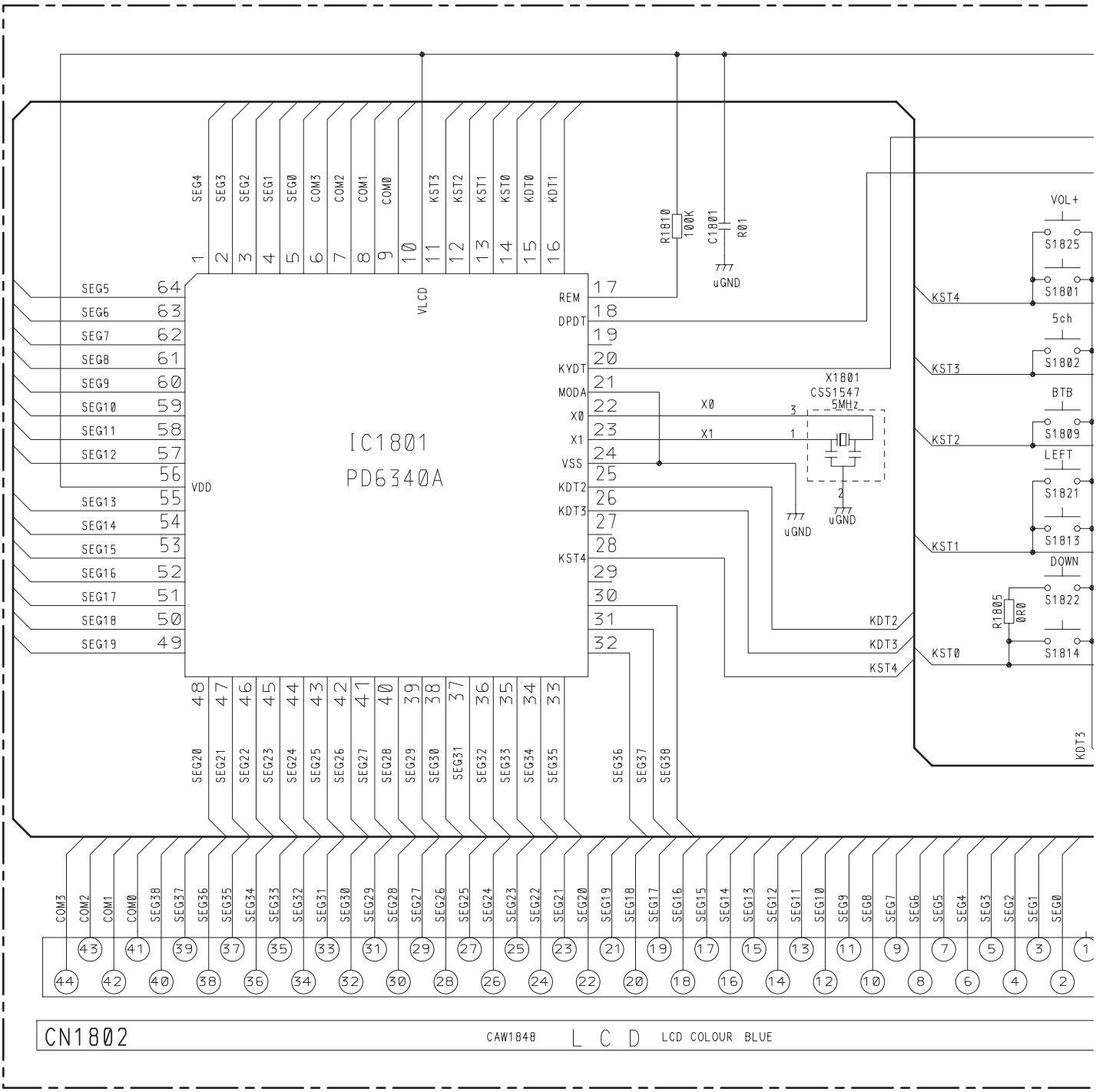
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

A-a
A-b

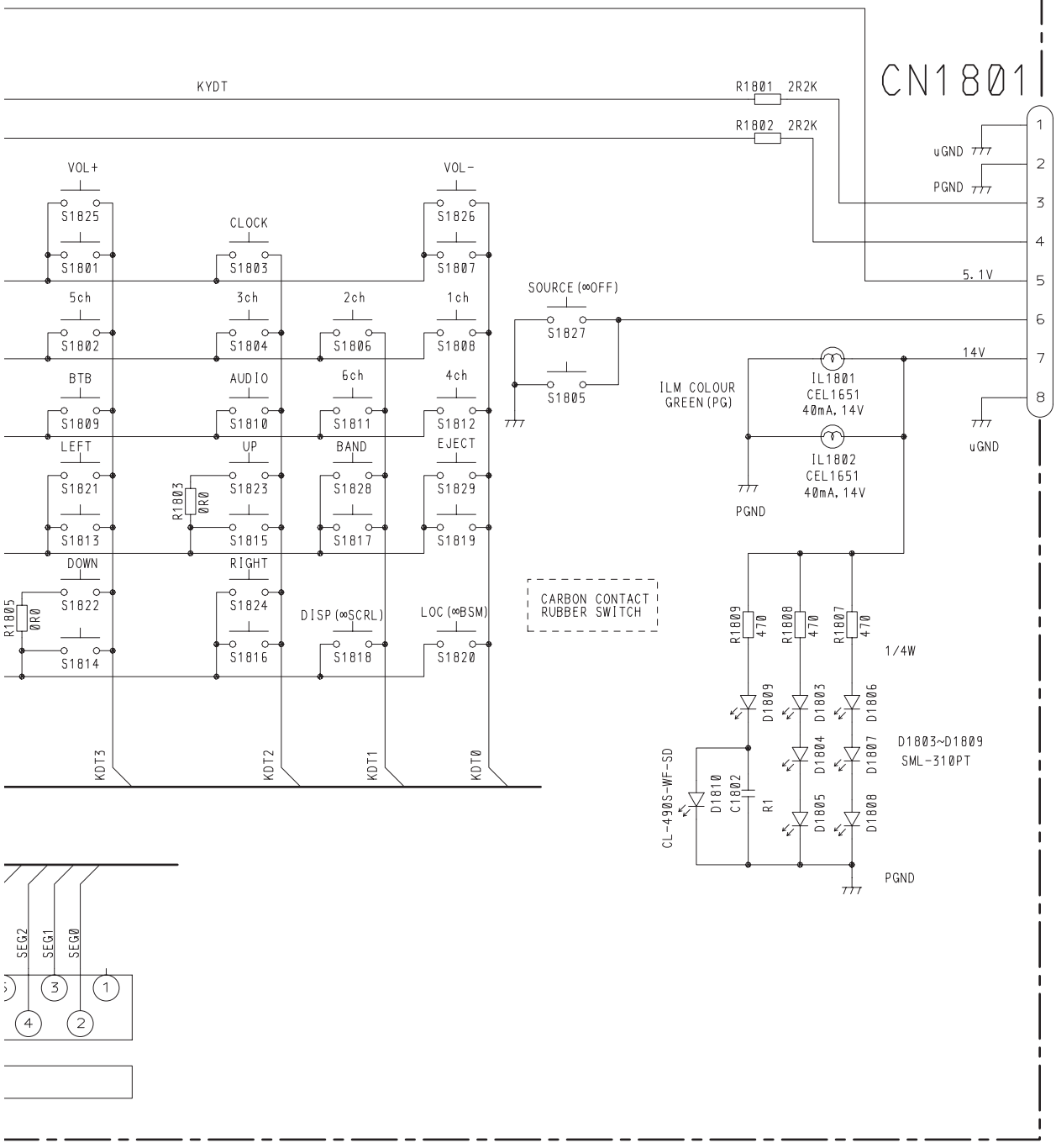

A TUNER AMP UNIT
CN352
CN901
RCA
AMP
MUTE
RESET
RRch
RLch
MAESTRO
IC151
PML010A
IC302
PAL007A
Evol
TUN3V
VDD
VCC
B. UP
FM: 29. 6dB
AM: 19. 1dB
CD: 36. 45dB
FM: 3. 6dB
AM: -6. 9dB
CD: 10. 45dB
A-a
A-b
A-b


CD: 36.45dB
CN901
SYS 8V REG
VDD
SENSE
MUTE
TUN 3V
RESET
SWVDD
ILMPW
B. UP
VCC
TUN 3V
VDD
SYSPW
DALMON
ASENS
BSENS
SWVDD
KVDT
DPDT
SOURCE
ILMPW
DSENS
RESET
CE1
CE2
VCK
VDT
VST
ANTPW
MUTE
SYSPW
VDCONT

3.3 KEYBOARD UNIT

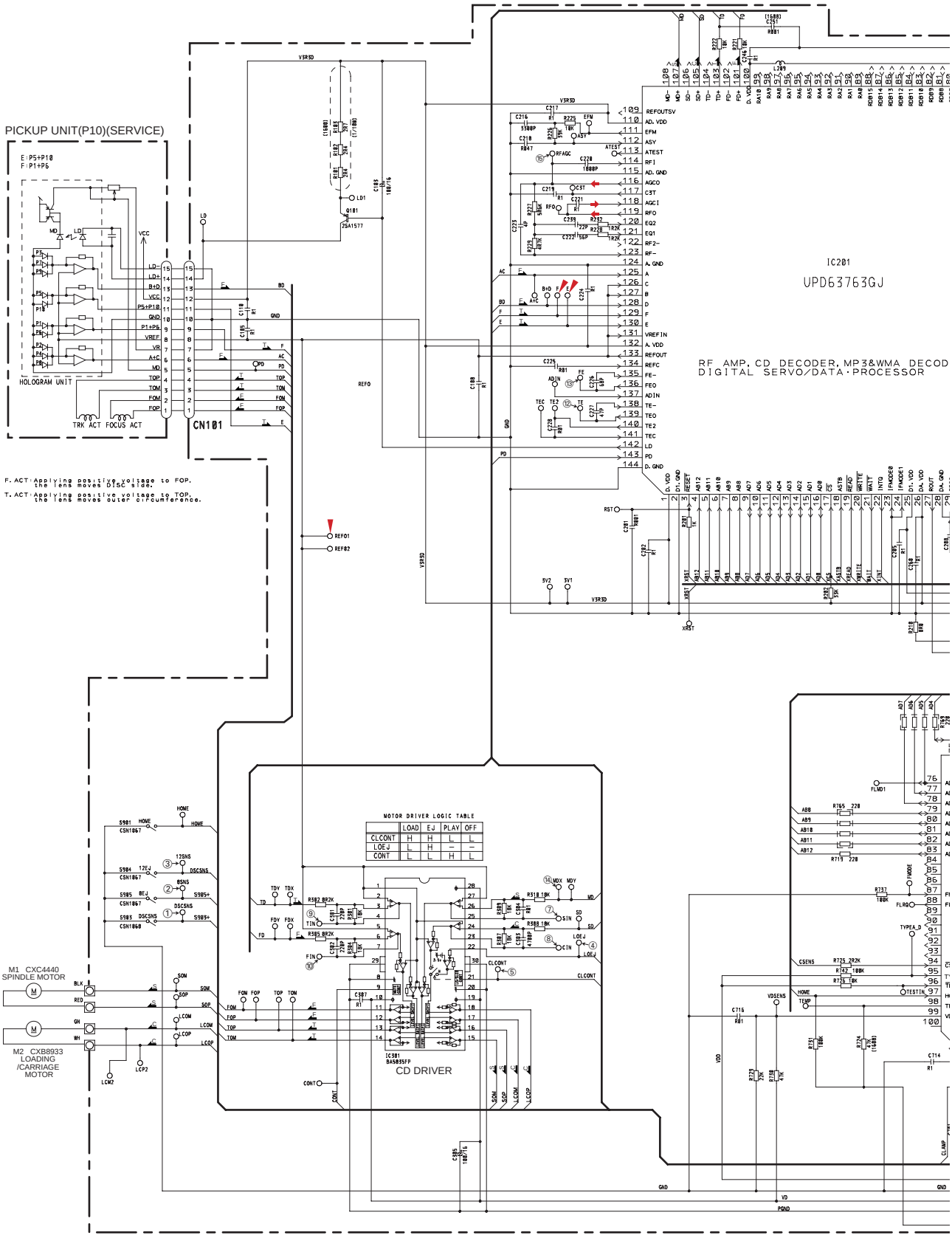


B KEYBOARD UNIT



3.4 CD MECHANISM MODULE(GUIDE PAGE)

C-a



C

C-b

NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

Ⓑ Monitor land(ø1.2mm)
Monitor land(ø0.8mm)
Land for manual soldering

SWITCHES:
CD CORE UNIT(S10.1)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

C CD CORE UNIT(S10.1)

MP3&WMA DECODER
PROCESSOR

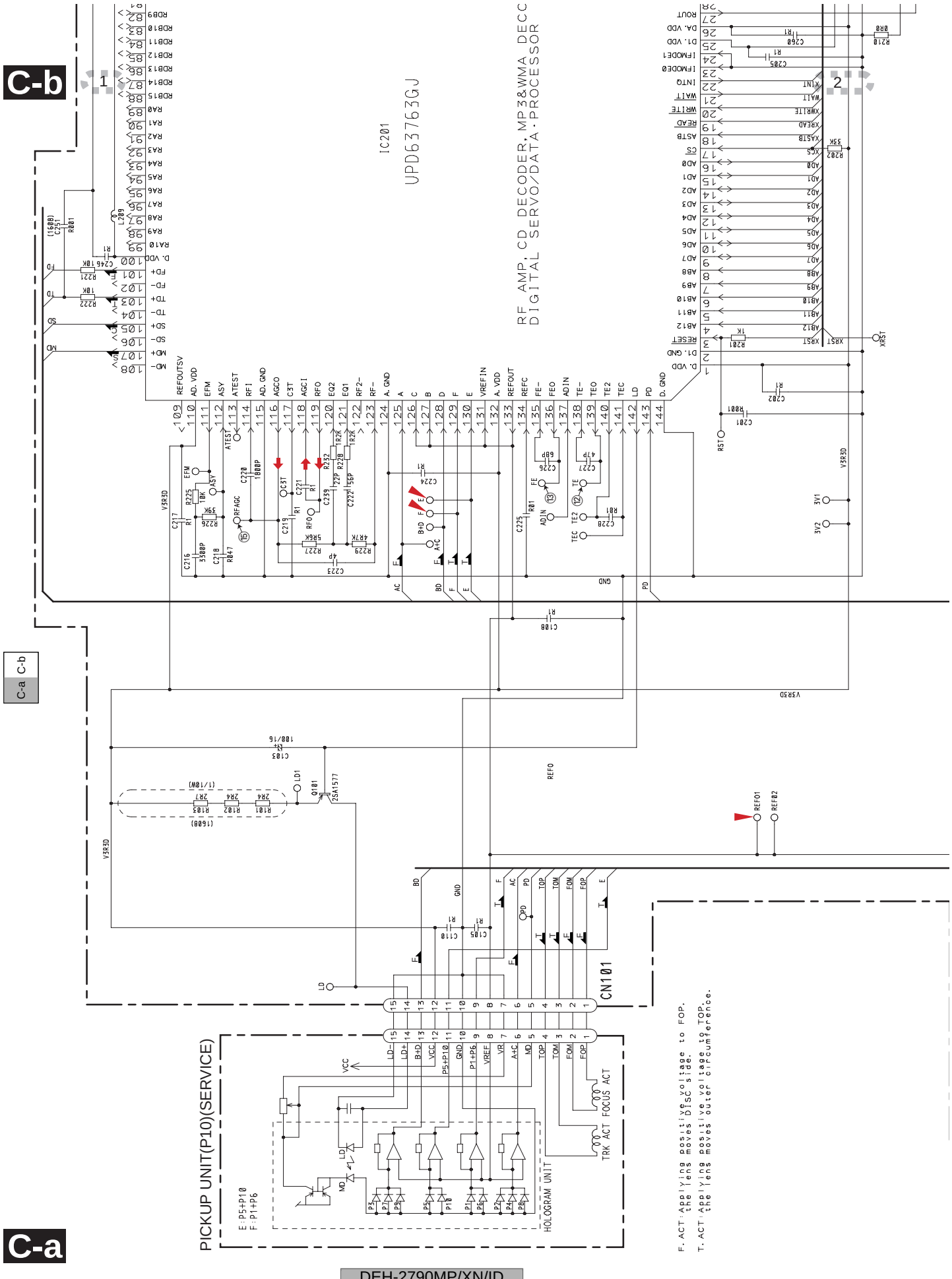
MICRO COMPUTER
IC701
PE5454A

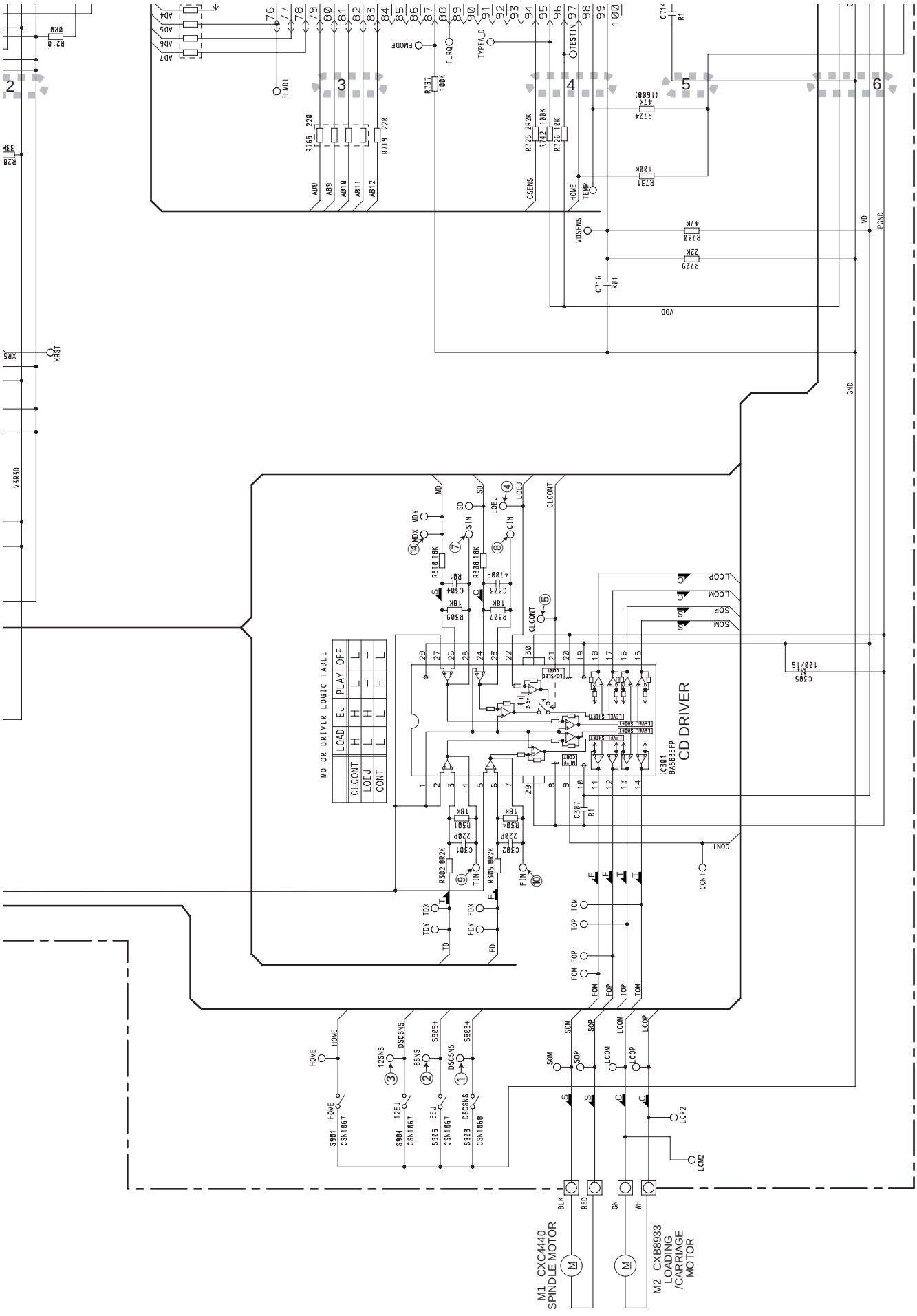
3.3V REGULATOR

3V REGULATOR

CN901

CN651


C-b
C-a
IC201
UPD63763GJ
RF AMP, CD DECODER, MP3&WMA DECC
DIGITAL SERVO/DATA PROCESSOR
CN101
PICKUP UNIT(P10)(SERVICE)
HOLOGRAM UNIT
TRK ACT FOCUS ACT
F. ACT : Applying positive voltage to FOP.
the lens moves DISC side
T. ACT : Applying positive voltage to TOP.
the lens moves outer circumference.


C-b
C-a
MOTOR DRIVER LOGIC TABLE
LOAD EJ PLAY OFF
CLCONT H H L L
LOEJ L H L H
CONT L L H L
CD DRIVER
IC301 BA5835FP
M1 CXC4440 SPINDLE MOTOR
M2 CXB8933 LOADING /CARRIAGE MOTOR
S901 HOME CSN1067
S904 12EJ CSN1067
S905 BEJ CSN1067
S903 DSCSNS CSN1068
C-b
C-a

C-b

C-a C-b

NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

Ⓑ Monitor land(φ1.2mm)
#:Monitor land(φ0.8mm)
◯ Land for manual soldering

SWITCHES:
CD CORE UNIT(S10.1)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF

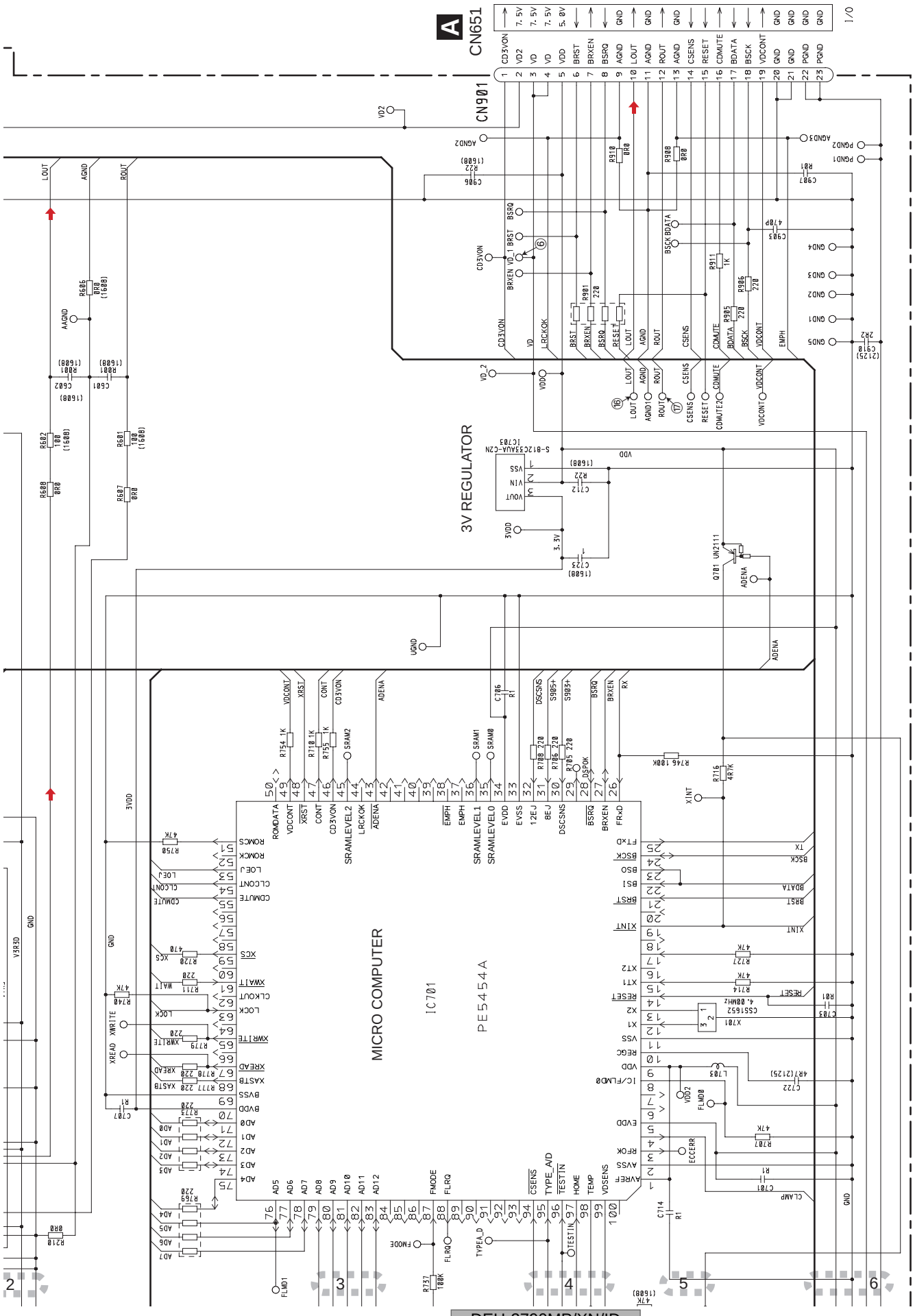
The underlined indicates the switch position.

SIGNAL LINE
F FOCUS SERVO LINE
T TRACKING SERVO LINE
C CARRIAGE SERVO LINE
S SPINDLE SERVO LINE

C CD CORE UNIT(S10.1)

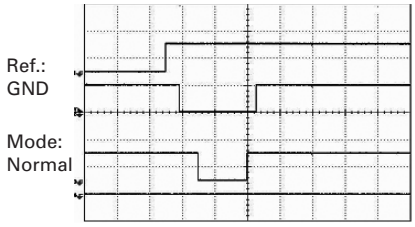
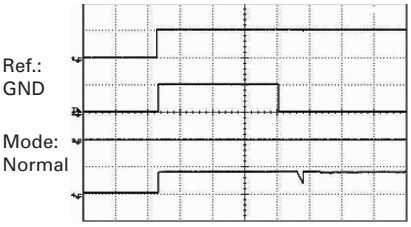
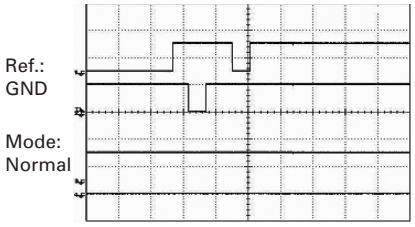
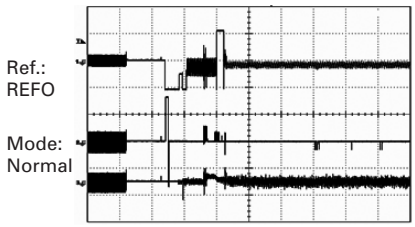
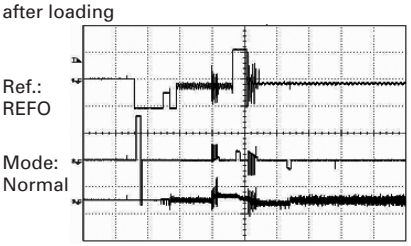
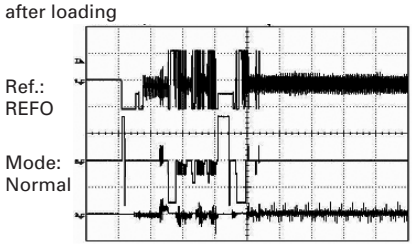
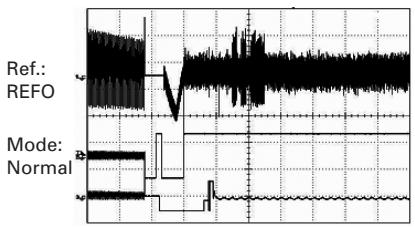
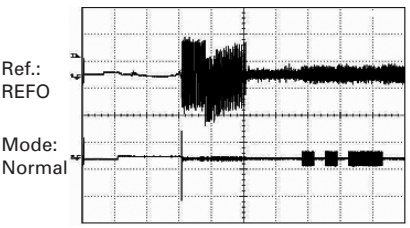
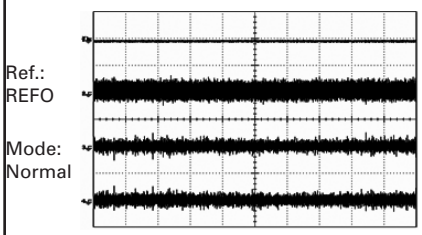
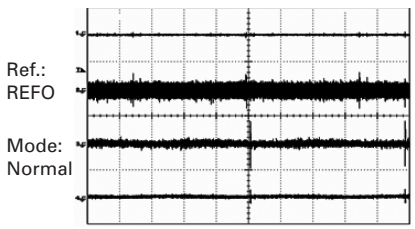
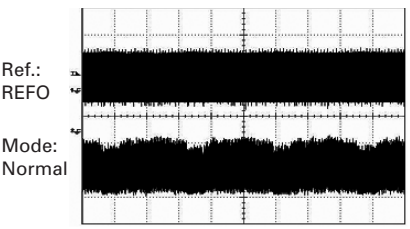
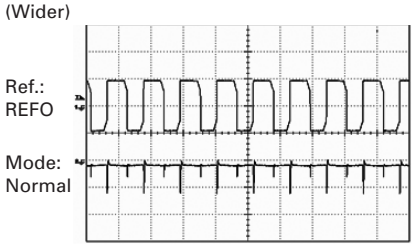
DEH-2790MP/XN/ID

3.3V REGULATOR


CN651
CN901
3V REGULATOR
MICRO COMPUTER
IC701
PE5454
C-a C-b
C-b

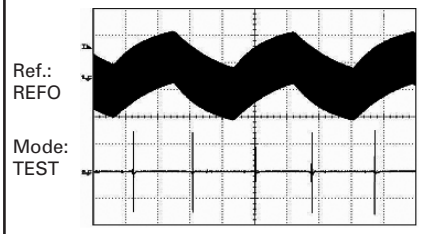
● Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65V)

① DSCSNS 5V/div 500ms/div ② 8SNS 5V/div ③ 12SNS 5V/div ④ LOEJ 5V/div 12 cm CD Loading operation  	① DSCSNS 5V/div 500ms/div ⑤ CLCONT 5V/div ④ LOEJ 5V/div ⑥ VD 10V/div 12 cm CD Loading operation  	① DSCSNS 5V/div 500ms/div ② 8SNS 5V/div ③ 12SNS 5V/div ④ LOEJ 5V/div 8 cm CD Loading operation 
⑦ SIN 1V/div 2s/div ⑧ CIN 500mV/div ⑨ TIN 500mV/div 12 cm CD-DA setup operation after loading  	⑦ SIN 1V/div 1s/div ⑧ CIN 500mV/div ⑨ TIN 500mV/div 12 cm CD-ROM(1 session) setup operation after loading  	⑦ SIN 1V/div 2s/div ⑧ CIN 500mV/div ⑨ TIN 500mV/div 12 cm CD-ROM(3 sessions) setup operation after loading 
⑩ FIN 200mV/div 500ms/div ⑪ RFOK 2V/div ⑦ SIN 2V/div 12 cm CD-DA Source On setup operation  	⑫ TE 500mV/div 200ms/div ⑬ FE 500mV/div Source On setup operation  	⑬ FE 500mV/div 20ms/div ⑩ FIN 500mV/div ⑫ TE 500mV/div ⑨ TIN 500mV/div CD-DA Play operation 
⑬ FE 500mV/div 20ms/div ⑩ FIN 500mV/div ⑫ TE 500mV/div ⑨ TIN 500mV/div CD-ROM play operation(Regular track Jump)  	⑭ MDX 1V/div 50ms/div ⑦ SIN 200mV/div Spindle waveform during play operation  	⑭ MDX 2V/div 5µs/div ⑦ SIN 1V/div Spindle waveform during play operation (Wider) 

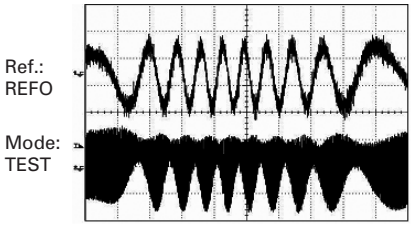
⑩ FIN 500mV/div 200ms/div
⑬ FE 500mV/div

Focus Search waveform



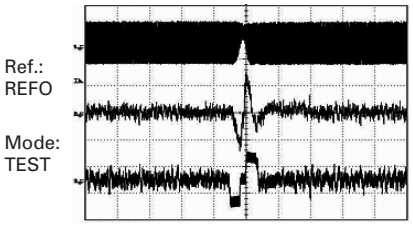
⑫ TE 500mV/div 2ms/div
⑮ RFAGC 500mV/div

Track Open waveform



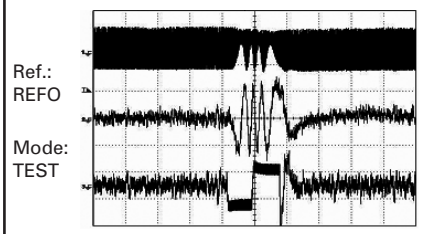
⑮ RFAGC 1V/div 500µs/div
⑫ TE 500mV/div
⑨ TIN 500mV/div

1 Track Jump waveform



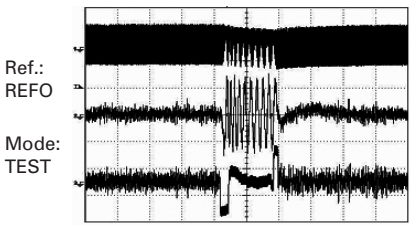
⑮ RFAGC 1V/div 500µs/div
⑫ TE 500mV/div
⑨ TIN 500mV/div

4 Tracks Jump waveform



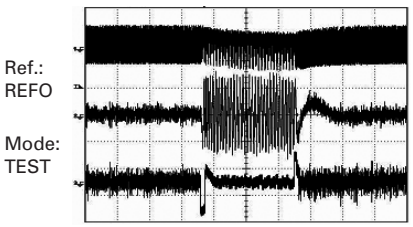
⑮ RFAGC 1V/div 1ms/div
⑫ TE 500mV/div
⑨ TIN 500mV/div

10 Tracks Jump waveform



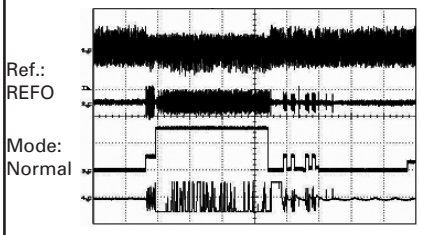
⑮ RFAGC 1V/div 2ms/div
⑫ TE 500mV/div
⑨ TIN 500mV/div

32 Tracks Jump waveform



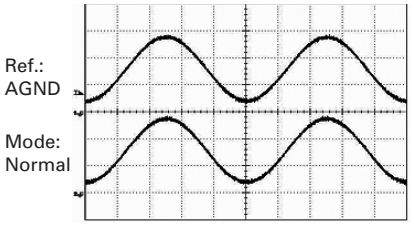
⑮ RFAGC 1V/div 200ms/div
⑫ TE 1V/div
⑧ CIN 500mV/div
⑦ SIN 2V/div

Search operation(Outter to Inner)



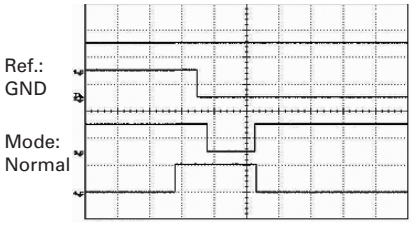
⑯ LOUT 1V/div 200µs/div
⑰ ROUT 1V/div

Analog audio waveform



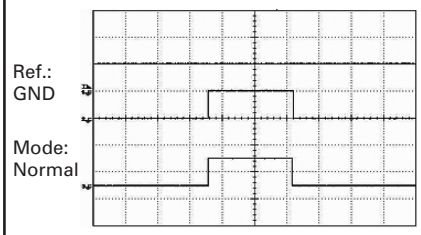
① DSCSNS 5V/div 500ms/div
② 8SNS 5V/div
③ 12SNS 5V/div
④ LOEJ 5V/div

12 cm CD Eject operation



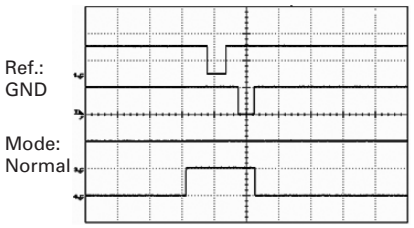
① DSCSNS 5V/div 500ms/div
⑤ CLCONT 5V/div
④ LOEJ 5V/div

12 cm CD Eject operation



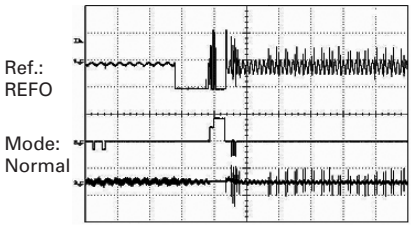
① DSCSNS 5V/div 500ms/div
② 8SNS 5V/div
③ 12SNS 5V/div
④ LOEJ 5V/div

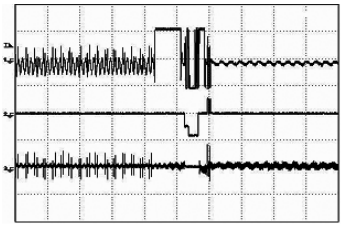
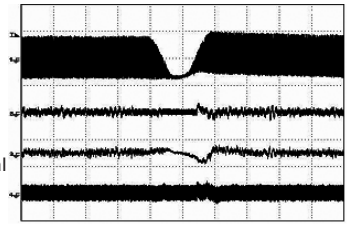
8 cm CD Eject operation



⑦ SIN 1V/div 500ms/div
⑧ CIN 500mV/div
⑨ TIN 500mV/div

CD-DA >> CD-ROM mode change(Band key)



⑦ SIN 1V/div 500ms/div ⑧ CIN 500mV/div ⑨ TIN 500mV/div CD-ROM >> CD-DA mode change(Band key) Ref.: REFO Mode: Normal 	⑮ RFAGC 1V/div 500µs/div ⑨ TIN 1V/div ⑫ TE 1V/div ⑩ FIN 1V/div Black dot(800µm) during play Ref.: REFO Mode: Normal 	

A

B

C

D

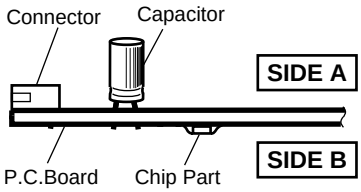
E

F

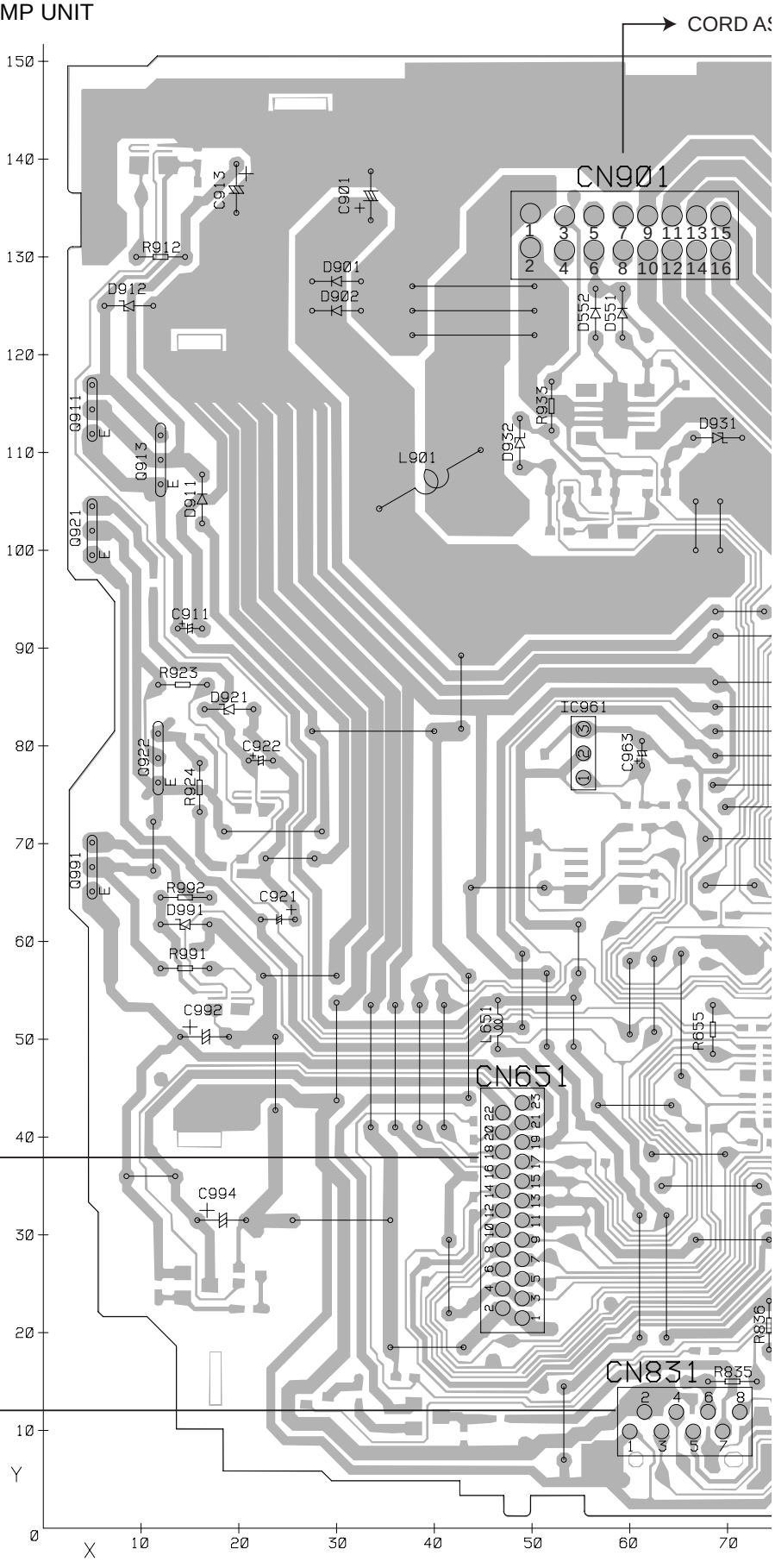
4. PCB CONNECTION DIAGRAM
4.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams

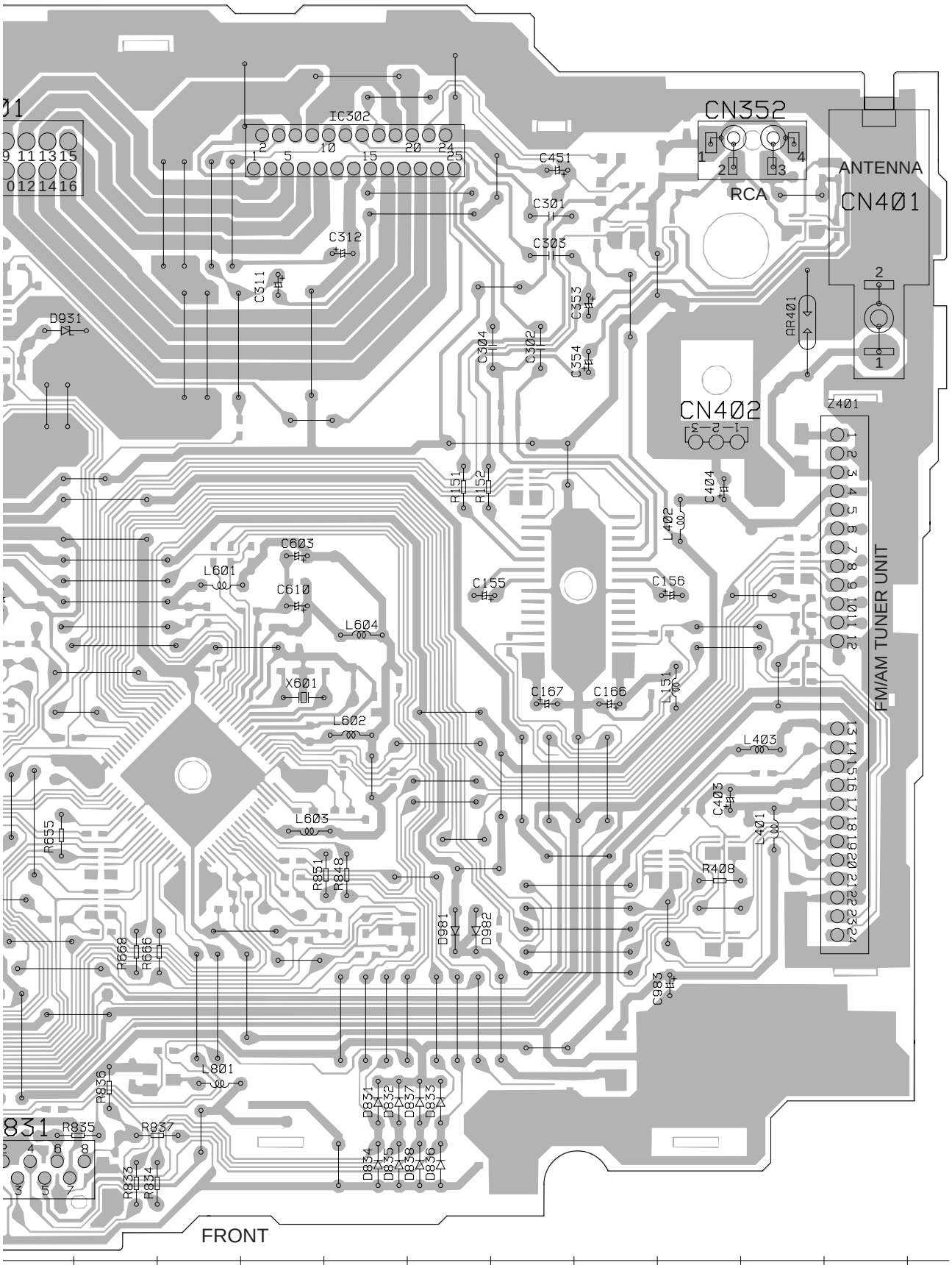


A TUNER AMP UNIT

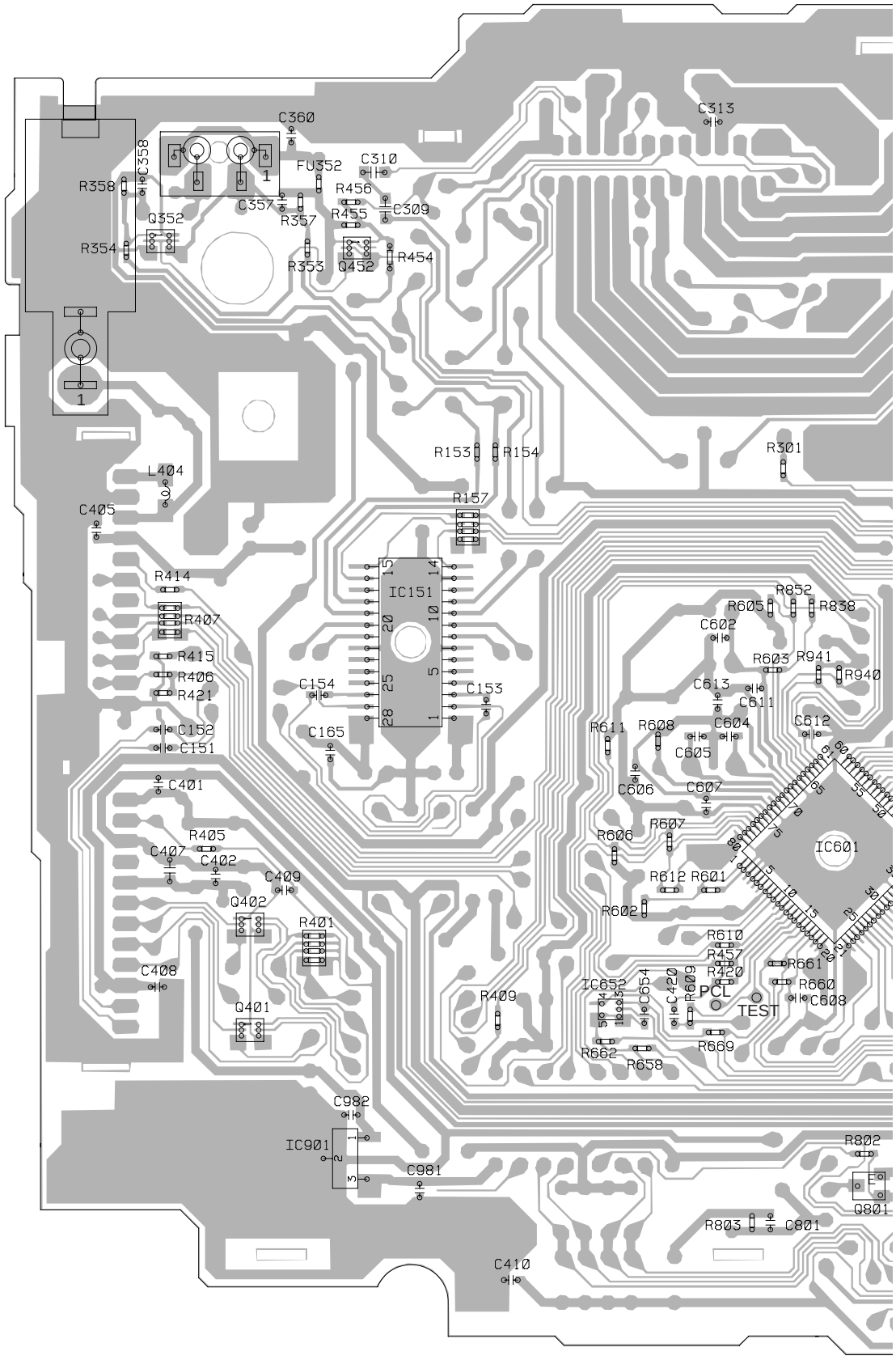


SIDE A

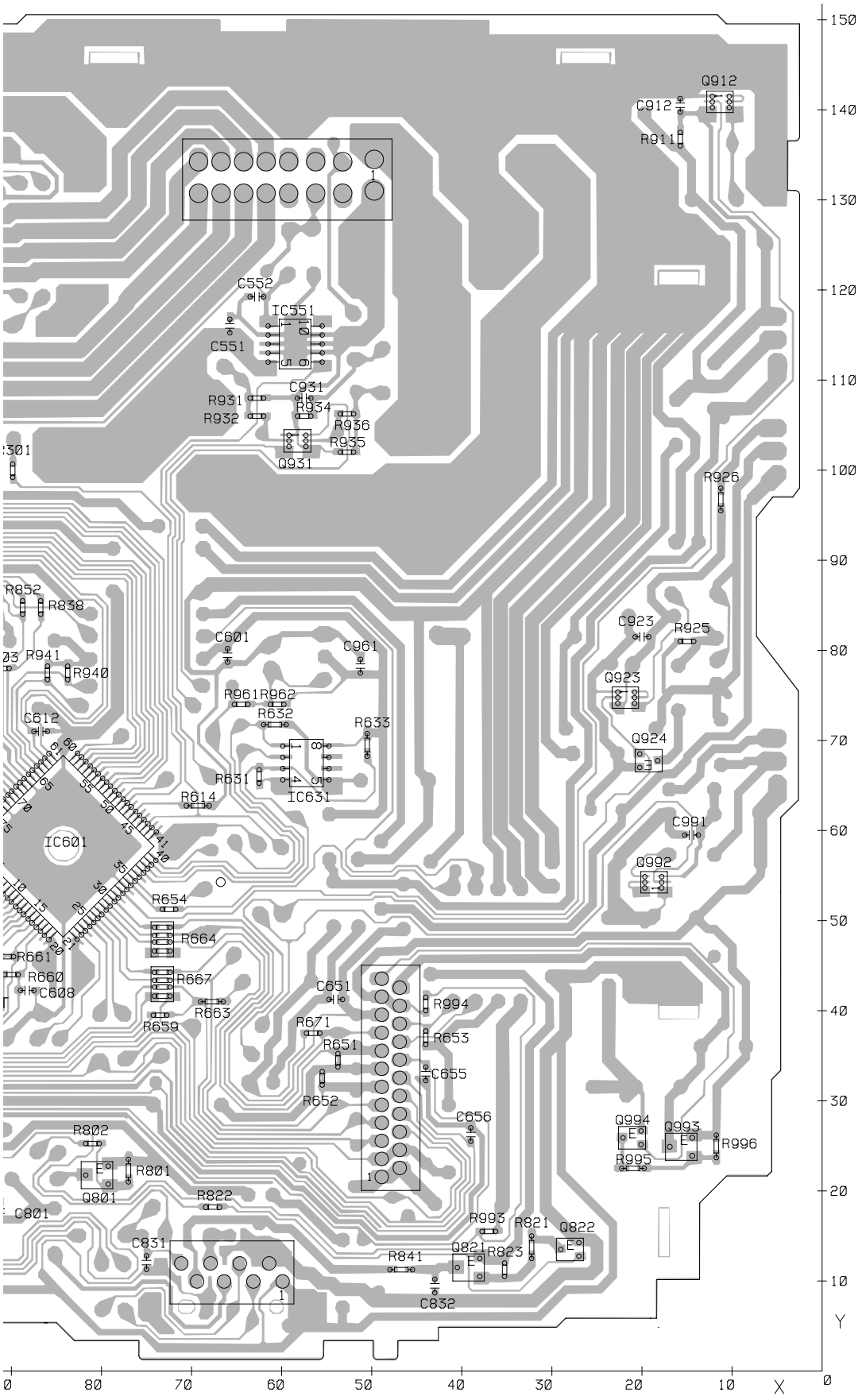
→ CORD ASSY



A TUNER AMP UNIT



SIDE B

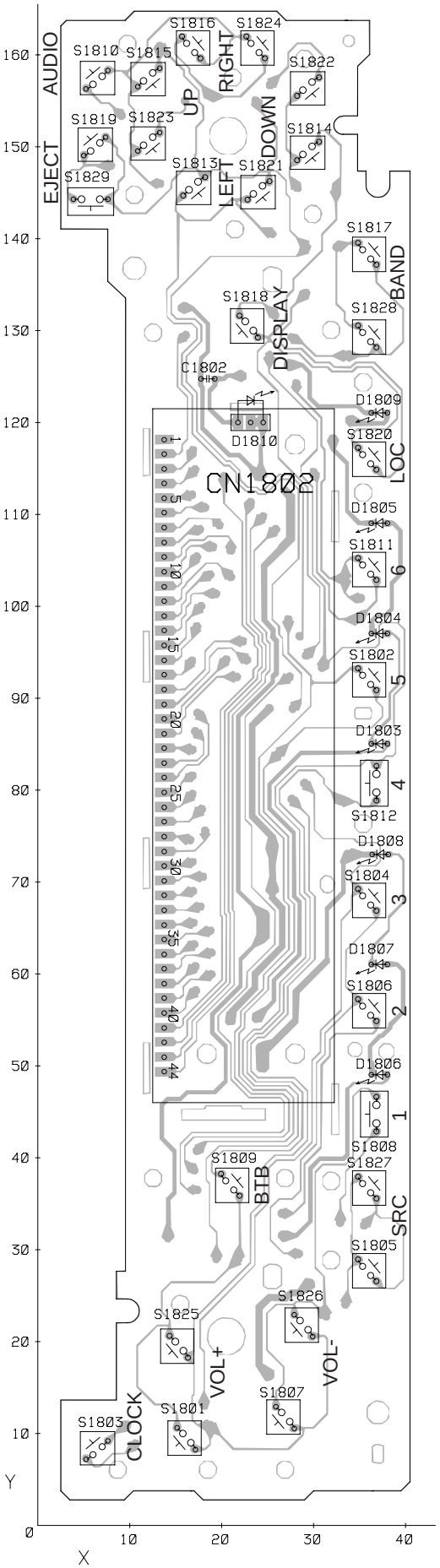


DEH-2790MP/XN/ID

4.2 KEYBOARD UNIT

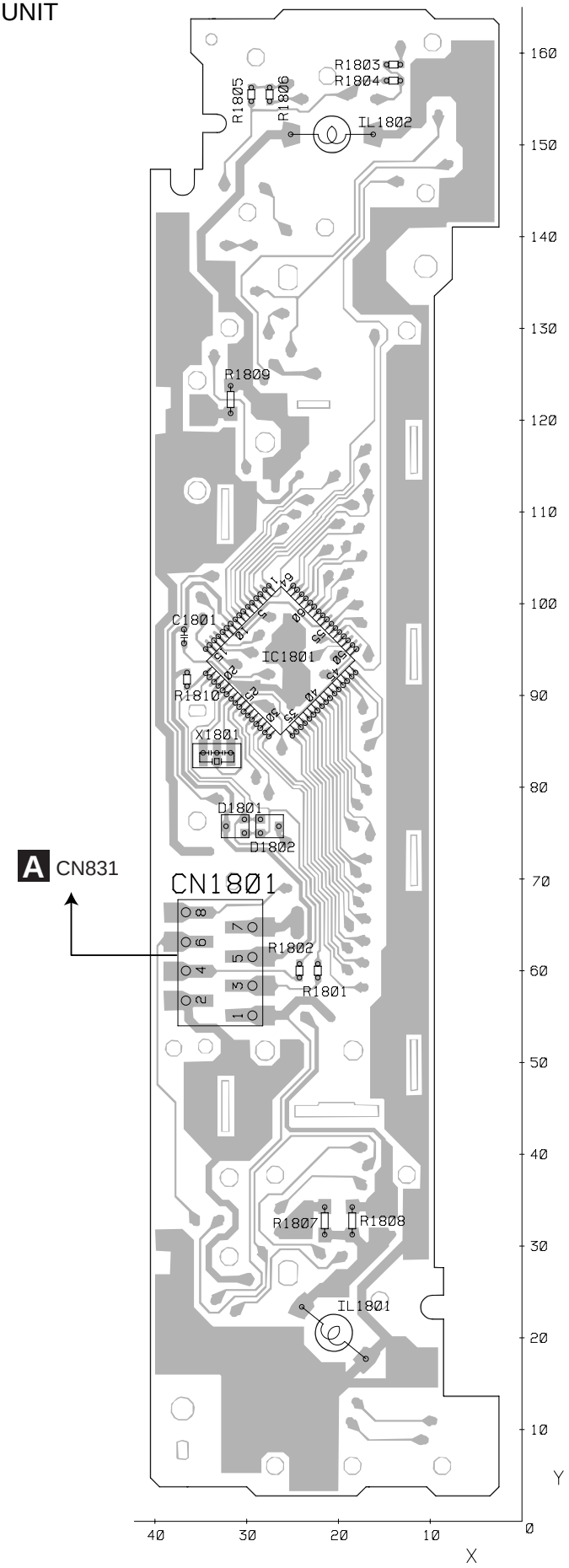
B KEYBOARD UNIT

SIDE A



B KEYBOARD UNIT

SIDE B

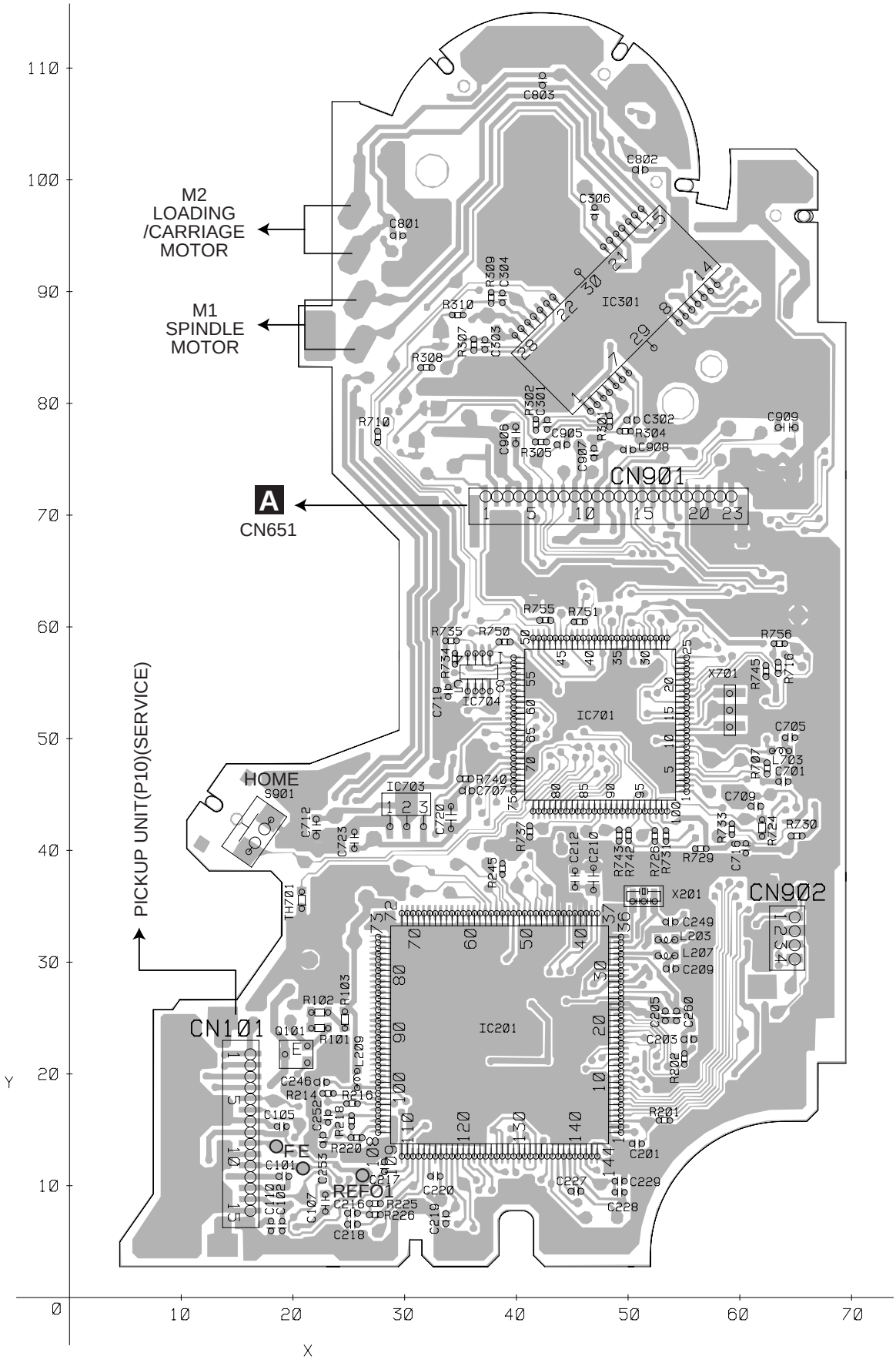


A CN831

4.3 CD CORE UNIT(S10.1)

C CD CORE UNIT(S10.1)

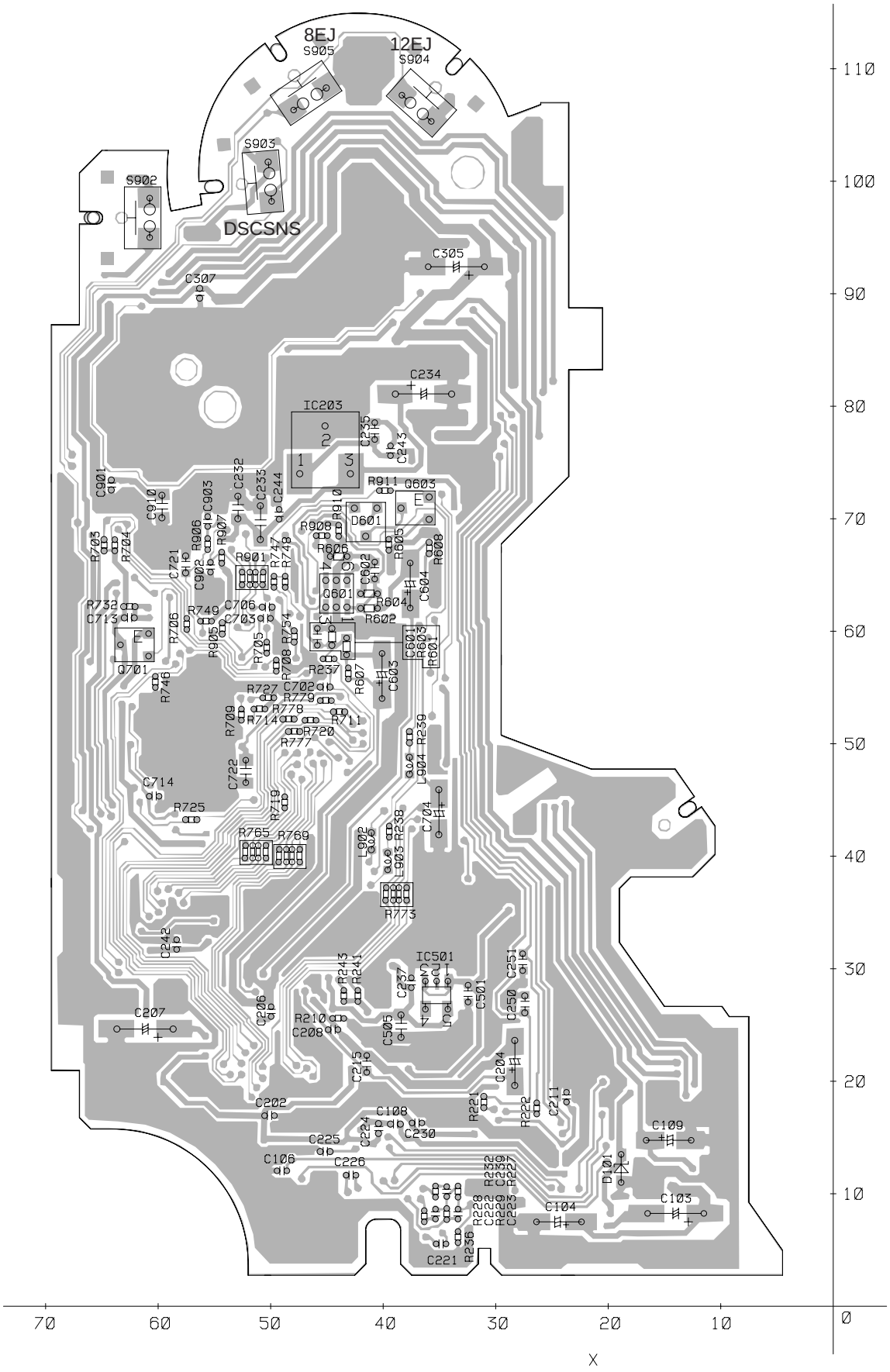
SIDE A



C

C CD CORE UNIT(S10.1)

SIDE B



5. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicatesthe importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

A

Unit Number:CWM9693(GS,ID)
Unit Number:CWM9970(CS)
Unit Name:Tuner Amp Unit

MISCELLANEOUS

Circuit Symbol and No.		Part No.
IC 151	(B,131,81) IC	PML010A
IC 302	(A,92,131) IC	PAL007A
IC 601	(B,84,58) IC	PE5447A
IC 901	(B,140,25) IC	BA33BC0FP
IC 961	(A,55,77) IC	S-80834CNY
Q 352	(B,158,125) Transistor	UMH3N
Q 452	(B,136,124) Transistor	UMD2N
Q 801	(B,81,22) Transistor	2SA1036K
Q 821	(B,39,12) Transistor	2SA1036K
Q 822	(B,28,14) Transistor	DTC114EU
Q 911	(A,5,112) Transistor	2SD2396
Q 912	(B,11,141) Transistor	UMD2N
Q 921	(A,5,100) Transistor	2SD2396
Q 923	(B,22,75) Transistor	UMD2N
Q 931	(B,58,103) Transistor	UMX1N
Q 991	(A,5,65) Transistor	2SD2396
Q 992	(B,19,54) Transistor	UMD2N
D 551	(A,59,122) Diode	MPG06G-6415G3
D 552	(A,57,122) Diode	MPG06G-6415G3
D 831	(A,107,17) Diode	1SS270
D 832	(A,109,17) Diode	1SS270
D 833	(A,114,17) Diode	1SS270
D 834	(A,107,9) Diode	1SS270
D 835	(A,109,9) Diode	1SS270
D 836	(A,114,9) Diode	1SS270
D 837	(A,112,17) Diode	1SS270
D 838	(A,112,9) Diode	1SS270
D 901	(A,33,128) Diode	MPG06G-6415G3
D 902	(A,33,125) Diode	MPG06G-6415G3
D 911	(A,16,103) Diode	MPG06G-6415G3
D 912	(A,11,125) Diode	HZS6L(B2)
D 921	(A,22,84) Diode	HZS9L(B3)
D 931	(A,67,112) Diode	HZS7L(C3)
D 932	(A,49,109) Diode	HZS7L(A1)
D 991	(A,17,62) Diode	HZS7L(C3)
L 151	(A,142,66) Inductor	LAU2R2K
L 401	(A,154,54) Inductor	LAU2R2K
L 402	(A,143,91) Inductor	LAU2R2K
L 404	(B,157,97) Inductor	LCTAW4R7J2520
L 601	(A,90,81) Ferri-Inductor	LAU100K
L 602	(A,101,63) Inductor	LAU2R2K
L 651	(A,47,54) Ferri-Inductor	LAU100K
L 801	(A,90,21) Inductor	LAU2R2K
L 901	(A,34,104) Choke Coil 600µH	CTH1280
X 601	(A,100,68) Radiator 12.58291MHz	CSS1402
⚠FU352	(B,141,131) Fuse 3A	CEK1286
AR401	(A,158,106) Surge Protector	DSP-201M-S00B
⚠	Fuse 10A	CEK1208
	FM/AM Tuner Unit	CWE1912

RESISTORS

R 151	(A,117,90)	RD1/4PU471J
R 152	(A,120,90)	RD1/4PU471J
R 153	(B,123,102)	RS1/16S471J
R 154	(B,121,102)	RS1/16S471J
R 157	(B,124,94)	RAB4C102J
R 301	(B,90,100)	RS1/16S153J
R 353	(B,142,124)	RS1/16S331J
R 354	(B,162,124)	RS1/16S331J
R 357	(B,143,129)	RS1/16S223J
R 358	(B,162,131)	RS1/16S223J
R 405	(B,153,59)	RS1/16S681J
R 407	(B,157,84)	RAB4C681J
R 414	(B,157,87)	RS1/16S681J
R 420	(B,96,44)	RS1/16S681J
R 421	(B,158,76)	RS1/16S473J
R 454	(B,133,123)	RS1/16S103J
R 455	(B,137,127)	RS1/16S153J
R 456	(B,137,129)	RS1/16S221J
R 457	(B,96,46)	RS1/16S681J
R 601	(B,98,54) (GS,ID)	RS1/16S473J
R 602	(B,105,52) (CS)	RS1/16S473J
R 606	(B,108,58)	RS1/16S104J
R 607	(B,102,59)	RS1/16S222J
R 609	(B,100,40)	RS1/16S473J
R 610	(B,96,48)	RS1/16S681J
R 611	(B,109,70)	RS1/16S473J
R 614	(B,69,63)	RS1/16S104J
R 633	(B,51,70)	RS1/16S104J
R 653	(B,44,37)	RS1/16S104J
R 654	(B,73,51)	RS1/16S102J
R 655	(A,69,54)	RD1/4PU102J

Circuit Symbol and No.		Part No.
R 658	(B,105,37)	RS1/16S473J
R 659	(B,74,40)	RS1/16S221J
R 660	(B,90,44)	RS1/16S221J
R 662	(B,109,38)	RS1/16S682J
R 663	(B,68,41)	RS1/16S682J
R 671	(B,57,38)	RS1/16S104J
R 801	(B,77,22)	RS1/16S153J
R 802	(B,81,25)	RS1/16S153J
R 803	(B,93,18)	RS1/16S222J
R 821	(B,32,14)	RS1/16S562J
R 822	(B,68,18)	RS1/16S102J
R 823	(B,35,11)	RS1/16S103J
R 833	(A,78,7)	RD1/4PU222J
R 834	(A,80,7)	RD1/4PU222J
R 835	(A,68,15)	RD1/4PU102J
R 836	(A,74,18)	RD1/4PU104J
R 837	(A,78,15)	RD1/4PU103J
R 838	(B,87,85)	RS1/16S102J
R 841	(B,47,11)	RS1/16S1R0J
R 848	(A,103,44)	RD1/4PU102J
R 851	(A,100,44)	RD1/4PU102J
R 852	(B,89,85)	RS1/16S102J
R 911	(B,16,137)	RS1/16S223J
R 912	(A,10,130)	RD1/4PU152J
R 923	(A,17,86)	RD1/4PU821J
R 926	(B,11,97)	RS1/16S221J
R 931	(B,63,108)	RS1/16S473J
R 932	(B,63,106)	RS1/16S104J
R 933	(A,52,112)	RD1/4PU102J
R 934	(B,58,106)	RS1/16S472J
R 935	(B,53,102)	RS1/16S473J
R 936	(B,53,106)	RS1/16S223J
R 940	(B,84,78)	RS1/16S104J
R 941	(B,86,78)	RS1/16S104J
R 961	(B,65,74)	RS1/16S102J
R 962	(B,61,74)	RS1/16S822J
R 991	(A,17,57)	RD1/4PU271J
R 992	(A,12,65)	RD1/4PU221J
R 993	(B,37,16)	RS1/16S222J
R 994	(B,44,41)	RS1/16S472J

CAPACITORS

C 151	(B,158,70)	CKSRYB224K10
C 152	(B,158,72)	CKSRYB224K10
C 153	(B,122,74)	CKSRYB105K6R3
C 154	(B,141,75)	CKSRYB105K6R3
C 155	(A,121,80)	CEJQ4R7M35
C 156	(A,141,80)	CEJQ4R7M35
C 165	(B,139,69)	CKSRYB104K16
C 166	(A,136,67)	CEJQ470M10
C 167	(A,126,67)	CEJQ100M16
C 301	(A,130,125)	CFTNA224J50
C 302	(A,126,107)	CFTNA224J50
C 303	(A,130,121)	CFTNA224J50
C 304	(A,120,107)	CFTNA224J50
C 309	(B,133,128)	CKSQYB225K10
C 310	(B,135,132)	CKSQYB225K10
C 312	(A,101,121)	CEJQ100M16
C 313	(B,98,138)	CKSRYB104K16
C 353	(A,132,116)	CEJQ2R2M50
C 354	(A,132,107)	CEJQ2R2M50
C 401	(B,158,66)	CKSRYB103K50
C 402	(B,152,56)	CKSRYB103K50
C 403	(A,149,54)	CEJQ470M6R3
C 404	(A,148,91)	CEJQ101M10
C 405	(B,165,93)	CKSRYB103K50
C 409	(B,144,54)	CCSRCH470J50
C 420	(B,102,40)	CCSRCH470J50
C 451	(A,129,131)	CEJQ330M10
C 601	(B,66,79)	CKSRYB103K50
C 603	(A,98,85)	CEJQ4R7M35
C 604	(B,96,71)	CCSRCH200J50
C 605	(B,99,71)	CCSRCH200J50
C 606	(B,106,67)	CKSRYB104K16
C 607	(B,98,63)	CCSRCH101J50
C 608	(B,88,42)	CCSRCH470J50
C 610	(A,98,79)	CEJQ4R7M35
C 613	(B,97,75)	CKSRYB105K6R3
C 651	(B,54,41)	CKSRYB683K16
C 801	(B,91,18)	CKSRYB104K16
C 832	(B,43,9)	CKSRYB104K16
C 901	(A,34,136)	CEAT332M16(P45)
C 911	(A,14,92)	CEJQ470M10
C 912	(B,16,141)	CKSRYB103K50
C 913	(A,20,140)	CEAT331M16
C 921	(A,22,62) 330µF/16V	CCH1326
C 922	(A,21,79)	CEJQ101M16
C 923	(B,20,82)	CKSRYB103K50
C 961	(B,51,78)	CKSRYB473K50
C 963	(A,61,78)	CEJQ100M16
C 981	(B,130,21)	CKSRYB334K10
C 983	(A,142,34)	CEJQ470M10
C 991	(B,15,60)	CKSRYB473K50
C 992	(A,14,50)	CEJQ221M10
C 994	(A,16,32)	CEJQ221M10

B

Unit Number:
Unit Name:Keyboard Unit

MISCELLANEOUS

IC 1801	(B,26,93) IC	PD6340A
D 1803	(A,37,84) LED	SML-310PT
D 1804	(A,37,96) LED	SML-310PT
D 1805	(A,37,108) LED	SML-310PT
D 1806	(A,37,48) LED	SML-310PT
D 1807	(A,37,60) LED	SML-310PT
D 1808	(A,37,72) LED	SML-310PT
D 1809	(A,37,120) LED	SML-310PT
D 1810	(A,23,119) LED	CL-490S-WF-SD
X 1801	(B,33,83) Ceramic Resonator 5.00MHz	CSS1547
IL 1801	(B,20,20) Lamp 40mA,14V	CEL1651
IL 1802	(B,20,150) Lamp 40mA,14V	CEL1651
	LCD	CAW1848

RESISTORS

R 1801	(B,22,59)	RS1/16S222J
R 1802	(B,24,59)	RS1/16S222J

Circuit Symbol and No.		Part No.
R 1803	(B,14,158)	RS1/16S0R0J
R 1805	(B,29,155)	RS1/16S0R0J
R 1807	(B,21,32)	RS1/4SA471J
R 1808	(B,18,32)	RS1/4SA471J
R 1809	(B,32,122)	RS1/4SA471J
R 1810	(B,36,91)	RS1/16S104J

CAPACITORS

C 1801	(B,37,96)	CKSRYB103K50
C 1802	(A,18,124)	CKSRYF104Z25

C

Unit Number:CWX3096
Unit Name:CD Core Unit(S10.1)

MISCELLANEOUS

IC 201	(A,39,24)	IC	UPD63763GJ
IC 203	(B,45,78)	IC	NJM2885DL1-33
IC 301	(A,49,88)	IC	BA5835FP
IC 701	(A,48,51)	IC	PE5454A
IC 703	(A,30,44)	IC	S-812C33AUA-C2N
Q 101	(A,20,22)	Transistor	2SA1577
Q 701	(B,62,59)	Transistor	UN2111
L 203	(A,53,32)	Inductor	CTF1389
L 207	(A,53,31)	Inductor	CTF1389
L 209	(A,26,20)	Inductor	CTF1389
L 703	(A,64,49)	Inductor	CTF1389
X 201	(A,51,35)	Ceramic Resonator 16.934MHz	CSS1603
X 701	(A,59,53)	Ceramic Resonator 4.00MHz	CSS1652
S 901	(A,15,43)	Switch(HOME)	CSN1067
S 903	(B,53,100)	Switch(DSCSNS)	CSN1068
S 904	(B,35,108)	Switch(12EJ)	CSN1067
S 905	(B,48,109)	Switch(8EJ)	CSN1067

RESISTORS

R 101	(A,22,24)	RS1/10SR2R4J
R 102	(A,22,26)	RS1/10SR2R4J
R 103	(A,25,25)	RS1/10SR2R7J
R 201	(A,53,16)	RS1/16SS102J
R 202	(A,55,21)	RS1/16SS333J
R 221	(B,31,18)	RS1/16SS103J
R 222	(B,26,18)	RS1/16SS103J
R 225	(A,27,8)	RS1/16SS103J
R 226	(A,27,7)	RS1/16SS393J
R 227	(B,33,10)	RS1/16SS562J
R 228	(B,36,8)	RS1/16SS122J
R 229	(B,34,8)	RS1/16SS472J
R 232	(B,35,10)	RS1/16SS122J
R 241	(B,42,28)	RS1/16SS333J
R 243	(B,44,28)	RS1/16SS333J
R 245	(A,39,38)	RS1/16SS333J
R 301	(A,48,78)	RS1/16SS183J
R 302	(A,42,78)	RS1/16SS822J
R 304	(A,50,78)	RS1/16SS183J
R 305	(A,42,77)	RS1/16SS822J
R 307	(A,36,85)	RS1/16SS183J
R 308	(A,32,83)	RS1/16SS183J
R 309	(A,38,89)	RS1/16SS183J
R 310	(A,35,88)	RS1/16SS183J
R 601	(B,43,59)	RS1/16S101J
R 602	(B,41,62)	RS1/16S101J
R 606	(B,44,67)	RS1/16S0R0J
R 607	(B,43,56)	RS1/16SS0R0J
R 608	(B,36,67)	RS1/16SS0R0J
R 705	(B,50,59)	RS1/16SS221J
R 706	(B,57,61)	RS1/16SS221J
R 707	(A,62,47)	RS1/16SS473J
R 708	(B,50,57)	RS1/16SS221J
R 710	(A,28,77)	RS1/16SS102J
R 711	(B,44,53)	RS1/16SS221J
R 714	(B,51,53)	RS1/16SS473J
R 716	(A,63,56)	RS1/16SS472J
R 719	(B,49,45)	RS1/16SS221J
R 720	(B,46,52)	RS1/16SS471J
R 724	(A,62,42)	RS1/16S473J
R 725	(B,57,43)	RS1/16SS222J
R 726	(A,52,41)	RS1/16SS103J
R 727	(B,50,54)	RS1/16SS473J
R 729	(A,57,40)	RS1/16SS223J
R 730	(A,65,41)	RS1/16SS473J
R 731	(A,53,41)	RS1/16SS104J
R 737	(A,41,42)	RS1/16SS104J
R 740	(A,35,46)	RS1/16SS473J
R 742	(A,50,41)	RS1/16SS104J
R 746	(B,60,56)	RS1/16SS104J
R 750	(A,39,59)	RS1/16SS473J
R 754	(B,48,60)	RS1/16SS102J
R 755	(A,43,61)	RS1/16SS102J
R 765	(B,51,40)	RAB4CQ221J
R 769	(B,48,40)	RAB4CQ221J
R 773	(B,39,37)	RAB4CQ221J
R 777	(B,48,51)	RS1/16SS221J
R 778	(B,48,52)	RS1/16SS221J
R 779	(B,45,54)	RS1/16SS221J
R 901	(B,52,65)	RAB4CQ221J
R 905	(B,54,60)	RS1/16SS221J
R 906	(B,56,68)	RS1/16SS221J
R 908	(B,45,69)	RS1/16SS0R0J
R 910	(B,44,69)	RS1/16SS0R0J
R 911	(B,40,73)	RS1/16SS102J

CAPACITORS

C 103	(B,14,8) 100µF/16V	CCH1504
C 105	(A,19,15)	CKSSYB104K10
C 108	(B,39,16)	CKSSYB104K10
C 110	(A,18,6)	CKSSYB104K10
C 201	(A,51,14)	CKSSYB102K50
C 202	(B,50,17)	CKSSYB104K10
C 203	(A,55,23)	CKSSYB104K10
C 204	(B,28,22)	CEVW220M6R3
C 205	(A,53,25)	CKSSYB104K10
C 208	(B,44,25)	CKSSYB104K10
C 209	(A,54,29)	CKSSYB104K10
C 212	(A,45,37)	CKSRYB105K10
C 216	(A,25,8)	CKSSYB332K50
C 217	(A,28,12)	CKSSYB104K10
C 218	(A,25,7)	CKSSYB473K10

Circuit Symbol and No.		Part No.
C 219	(A,34,7)	CKSSYB104K10
C 220	(A,33,11)	CKSSYB182K50
C 221	(B,35,6)	CKSSYB104K10
C 222	(B,35,8)	CCSSCH560J50
C 223	(B,33,8)	CCSSCH4R0C50
C 224	(B,40,16)	CKSSYB104K10
C 225	(B,45,14)	CKSSYB103K16
C 226	(B,43,12)	CCSSCH680J50
C 227	(A,45,10)	CCSSCH470J50
C 228	(A,49,9)	CKSSYB103K16
C 234	(B,36,81)	CEVW221M4
C 237	(B,38,29)	CKSSYB104K10
C 239	(B,34,10)	CCSSCH220J50
C 242	(B,58,32)	CKSSYB104K10
C 243	(B,39,76)	CKSSYB104K10
C 244	(B,49,70)	CKSSYB104K10
C 246	(A,23,19)	CKSSYB104K10
C 251	(B,28,31)	CKSRYB102K50
C 260	(A,54,25)	CKSSYB104K10
C 301	(A,43,78)	CKSSYB221K50
C 302	(A,50,79)	CKSSYB221K50
C 303	(A,37,85)	CKSSYB472K25
C 304	(A,39,89)	CKSSYB103K16
C 305	(B,34,92)	CEVW101M16
C 307	(B,56,90)	CKSSYB104K10
C 601	(B,46,60)	CCSRCH102J50
C 602	(B,41,65)	CCSRCH102J50
C 701	(A,64,46)	CKSSYB104K10
C 703	(B,50,61)	CKSSYB103K16
C 706	(B,50,62)	CKSSYB104K10
C 707	(A,36,45)	CKSSYB104K10
C 712	(A,22,42)	CKSRYB224K16
C 714	(B,60,45)	CKSSYB104K10
C 716	(A,61,40)	CKSSYB103K16
C 722	(B,52,48)	CKSQYB475K6R3
C 723	(A,26,41)	CKSRYB105K10
C 903	(B,56,70)	CKSSYB471K50
C 906	(A,40,77)	CKSRYB224K16
C 907	(A,47,76)	CKSSYB103K16
C 910	(B,60,71)	CKSQYB225K10

Miscellaneous Parts List

	Pickup Unit(P10)(Service)	CXX1641
M 1	Motor Unit(SPINDLE)	CXC4440
M 2	Motor Unit(LOADING/CARRIAGE)	CXB8933

6. ADJUSTMENT
6.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

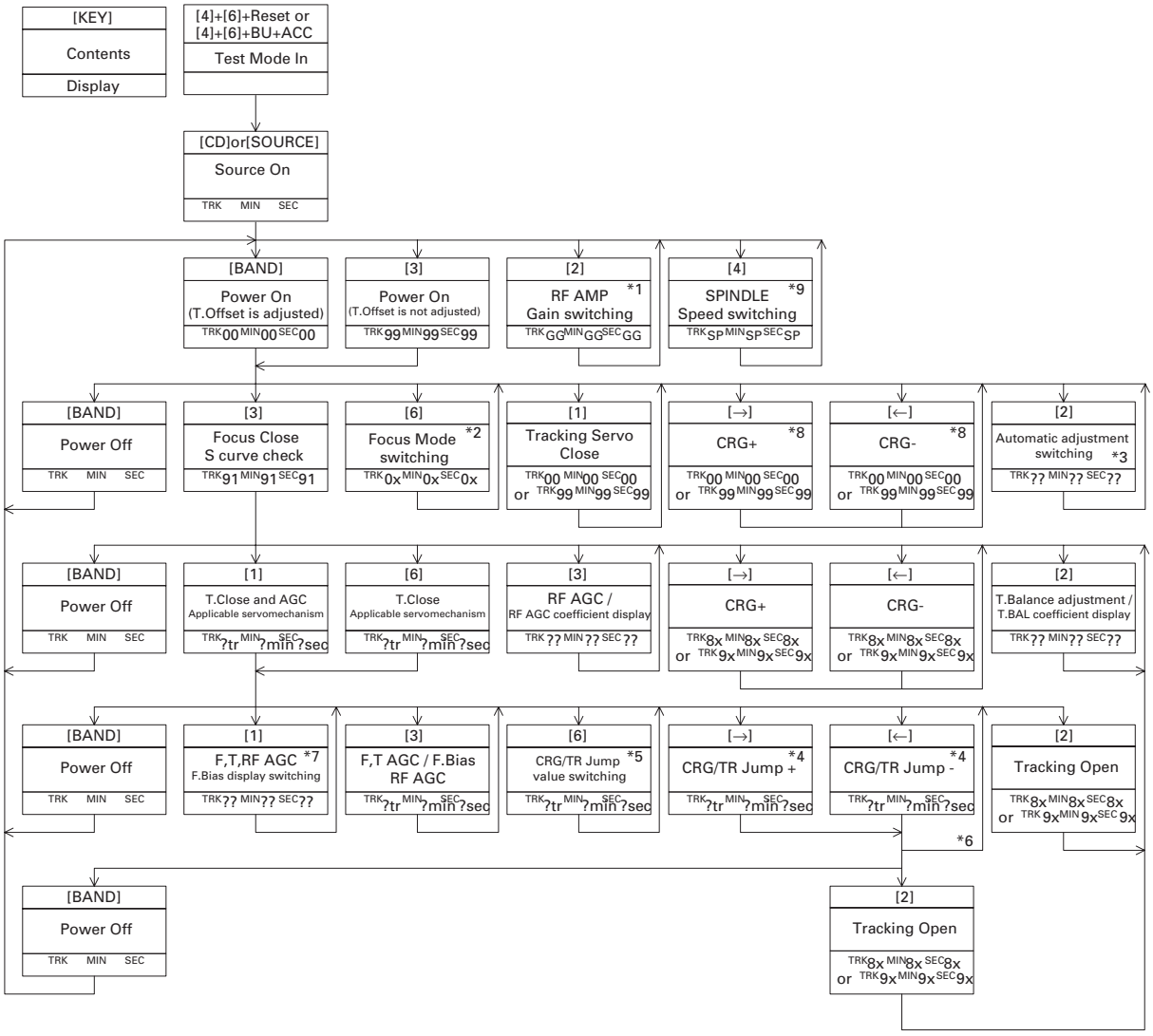
• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.
• To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
• To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

● Flow Chart



*1) TYP (TRK MIN SEC) → -6dB (TRK 06 MIN 06 SEC 06) → -12dB (TRK 12 MIN 12 SEC 12)

*2) Focus Close (TRK 00 MIN 00 SEC 00 / TRK 99 MIN 99 SEC 99) → S.Curve check setting (TRK 01 MIN 01 SEC 01) → F EQ measurement setting (TRK 02 MIN 02 SEC 02)

*3) F.Offset Display → T.Offset Display → Switch to the order of the original display

*4) 1TR / 32TR / 100TR

*5) Single TR → 32TR → 100TR → CRG Move
9x(8x) : 91(81) 92(82) 93(83) 94(84)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC → F Bias → RF AGC

*8) CRG motor voltage = 2[V]

*9) Applicability : A, B, C, D, E, F
TYP(1X) (TRK MIN SEC) → 2X (TRK 22 MIN 22 SEC 22) → 1X (TRK 11 MIN 11 SEC 11)
As for the double speed (2x), audio output cannot be supported

Applicability : G
TYP(2X) (TRK MIN SEC) → 1X (TRK 11 MIN 11 SEC 11) → 2X (TRK 22 MIN 22 SEC 22)

[Key]	Operation Test Mode
[BAND]	Power On / Off
[→]	CRG + / TR Jump + (Direction of the external surface)
[←]	CRG - / TR Jump - (Direction of the internal surface)
[1]	U.CLS and AGC and Applicable servomechanism / AGC, AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T.Open
[3]	Close, S.Curve / Rough Servo and RF AGC / F, T, RF AGC
[4]	SPDL 1X / 2X switching As for the double speed (2x), audio output cannot be supported.
[5]	Error Rate measurement 1st - ON : ERR count Beginning (30Sec) 2nd - ON : BER display data [%]
[6]	F.Mode switching / Tracking Close / CRG • TR Jump switching

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

• **Note :**
The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

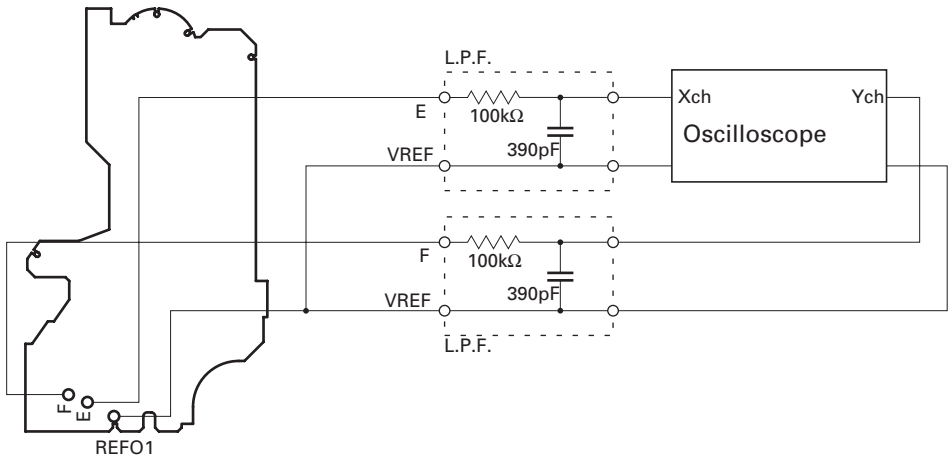
• **Purpose :**
To check that the grating is within an acceptable range when the PU unit is changed.

• **Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• **Method :**

• Measuring Equipment	• Oscilloscope, Two L.P.F.
• Measuring Points	• E, F, REFO1
• Disc	• TCD-782
• Mode	• TEST MODE

CD CORE UNIT(S10.1)



• **Checking Procedure**
1. In test mode, load the disc and switch the 3V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

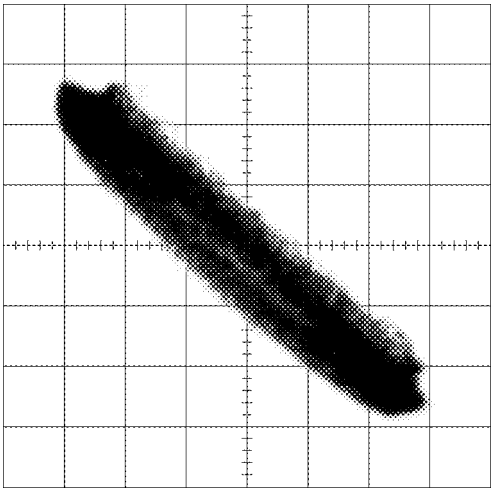
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• **Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

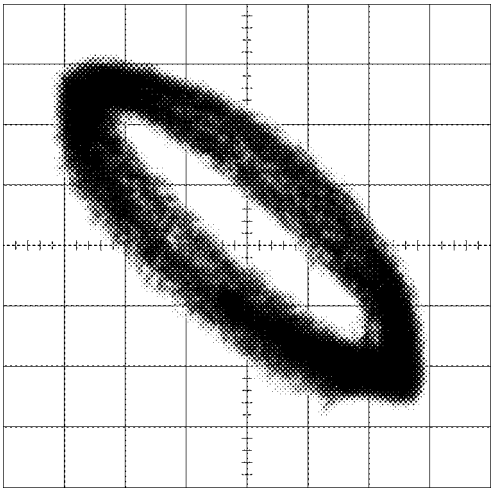
Grating waveform

Ech → Xch 20mV/div, AC
Fch → Ych 20mV/div, AC

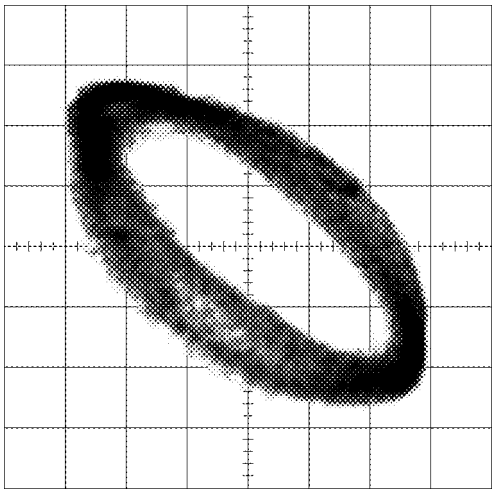
0°



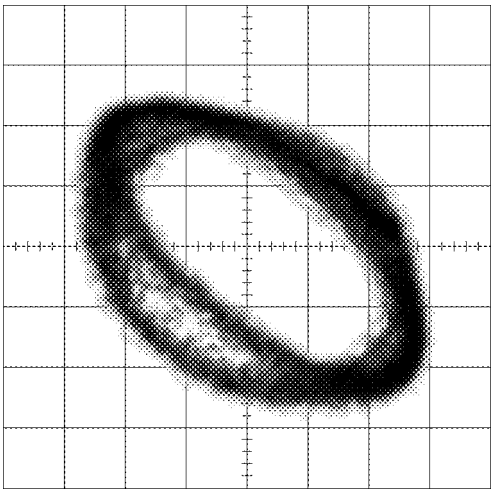
30°



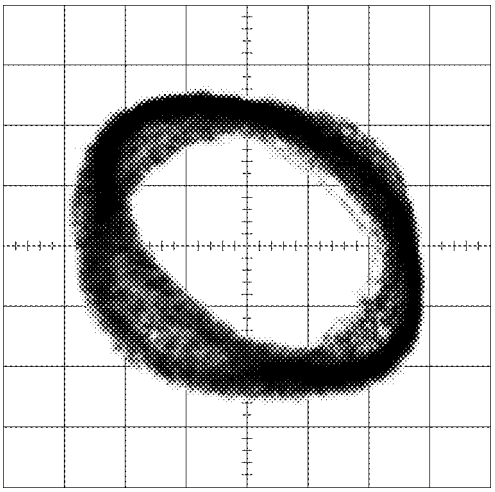
45°



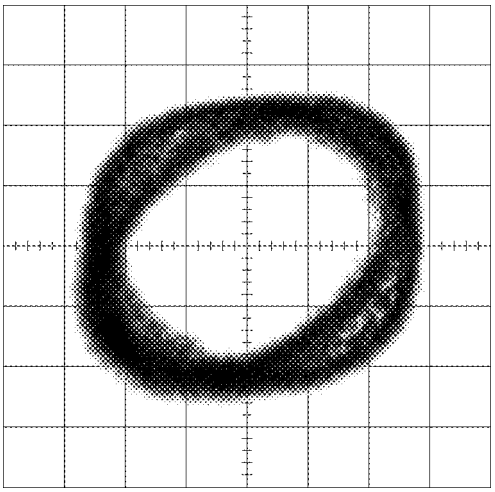
60°



75°



90°



6.3 ERROR MODE

● Error Messages

Error is displayed with number for Error cause when CD is inoperative or stops with Error during operation. The purpose is to reduce nonsense calls from users as well as to assist all related analysis and repair for defects at service station.

(1) Basic Display Method

1) When CSMOD (CD mode area for system) is SERRORM, Error code will be written in DMIN (minutes area for display), DSEC (seconds area for display). The same data shall be written in DMIN and DSEC. DTNO is blank as usual.

2) Display Example of Head Unit

The following is about LCD display ability. xx is Error number.

8 digits	6 digits	4 digits
ERROR–xx	ERR–xx OR Err–xx	E–xx

(2) Error Code List

No.	Classification	Contents	Details • Cause
10	Electricity	Carriage Home NG	CRG can't move to the inner. CRG can't move from the inner. → HOME SW failure, CRG movement failure.
11	Electricity	Focus Search NG	Focus can't be caught. → Back of Disc / Severe dirt and vibration.
12	Electricity	Spindle Lock NG Subcode NG RF-amp NG	Not spindle, lock. Wrong subcode (can't read). → Defective Spindle. Scratch and dirt on Disc. Intense vibration. The appropriate gain of the RF amp cannot be obtained. → Defective spindle. → Scratched or dirty disc. Severe vibration. Abnormal CD signals. → Blanc CD-R disc. Disc inserted upside down.
17	Electricity	Setup NG	AGC protection doesn't work, out of Focus soon. → Scratch on Disc/Severe dirt and vibration.
22	Disc	Impossible to play	There is no playable MP3 or WMA file present in a disc. → No MP3 or WMA file exists in a CD-ROM disc inserted.
23	Disc	File Format NG	Contents are stored in an incompatible file format. → The contents in a CD-ROM disc inserted are recorded in a file format other than ISO9660 Level-1 and 2.
30	Electricity	Search Time Out	Can't reach the target address. → Defective CRG/tracking, or scratch on Disc.
44	Disc	Impossible to play	There is no playable TRK No. present in a disc. → All TRK Nos. In a disc inserted are specified as a track which should be skipped, in the track skip information.
50	Mecha	Disc Load / Eject NG	Disc loading/ejection cannot be complete. → Foreign objects entered into the mechanism. Disc caught in between during loading/ejection.
A0	System	Power NG	Power supply (VD) isn't connected to the ground. → Defective SW transistor. Abnormal power (failed connector)

Note : Error doesn't display in mechanism only. (CD off causes mechanism off)
If TOC can't be read, error wouldn't occur, but mechanism still continues its operation.
The upper digits of error code is mainly classified by 3 kinds as follows:
1x: Setup related error, 3x: Search related error, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM

● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN (Pin 15) terminal to H. The clock signal is output from the PCL terminal (Pin 14). The frequency of the clock signal is 786.432kHz that is one 16th of the fundamental frequency. The clock signal should be 786.432kHz ± 31.5Hz. If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● Removing the Case (not shown)

1. Remove the Case.

● Removing the CD Mechanism Module (Fig.1)

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● Removing the Grille Assy (Fig.1)

2 Release the two latchs and then remove the Grille Assy.

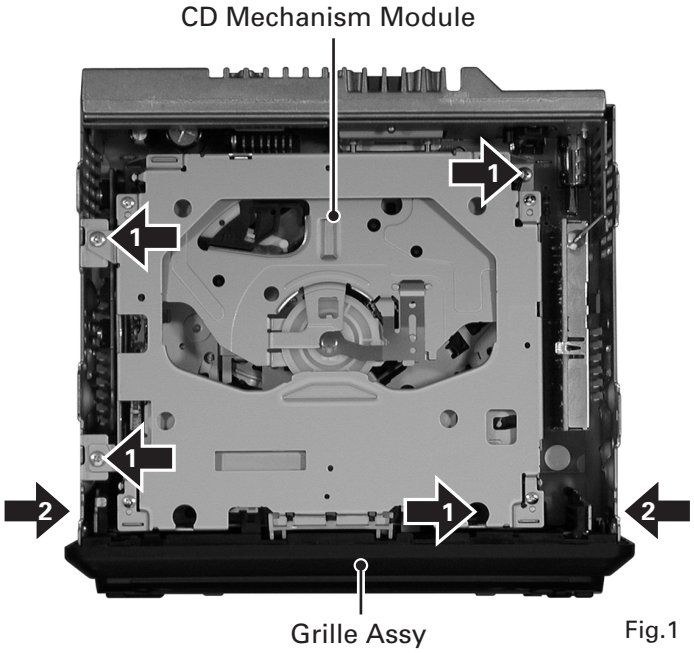


Fig.1

● Removing the Tuner Amp Unit (Fig.2)

1 Remove the screw.

2 Remove the three screws.

3 Straighten the tabs at three locations indicated.

4 Remove the screw and then remove the Tuner Amp Unit.

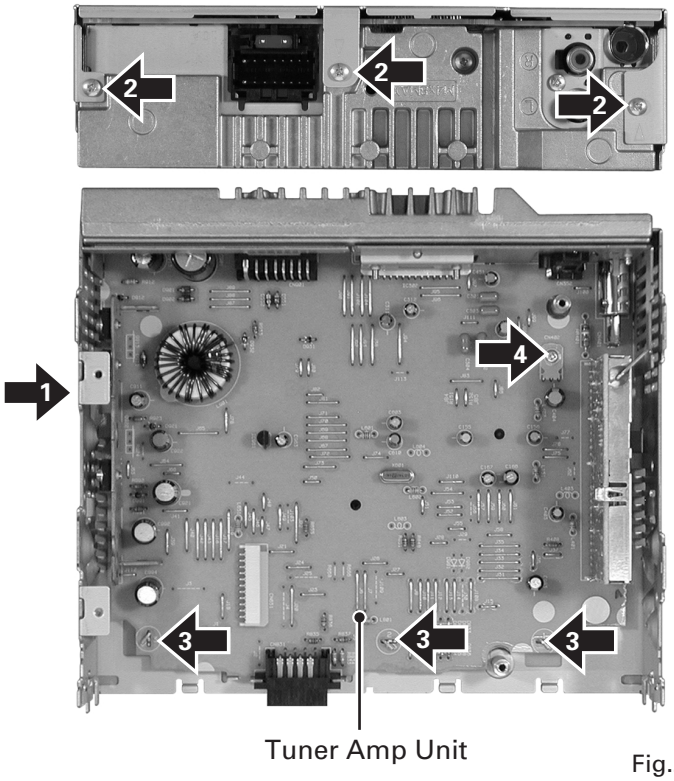
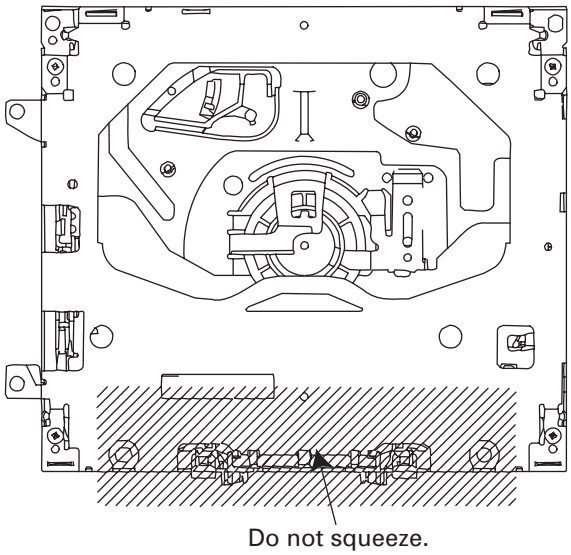


Fig.2

● How to hold the Mechanism Unit

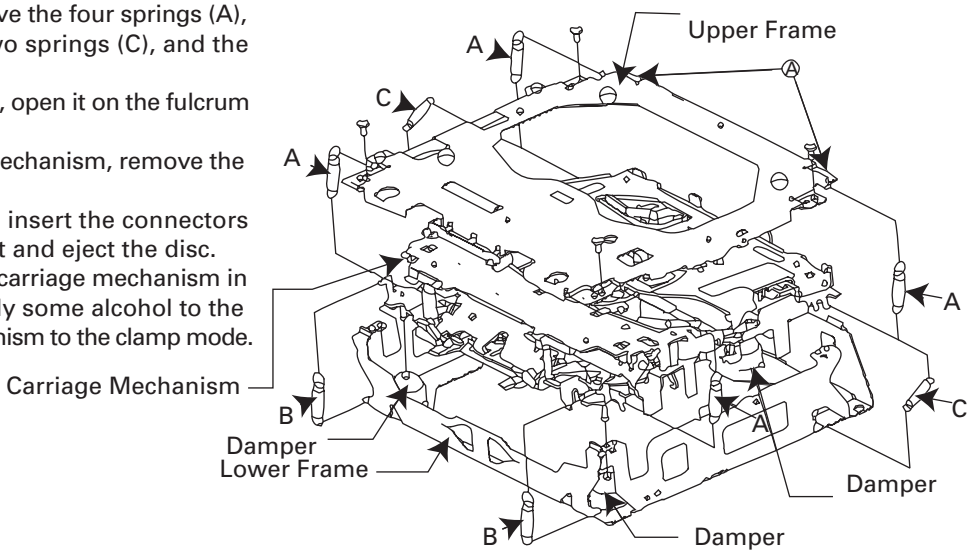
1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.



● Removing the Upper and Lower Frames

1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum A.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the frames removed, insert the connectors coming from the main unit and eject the disc.

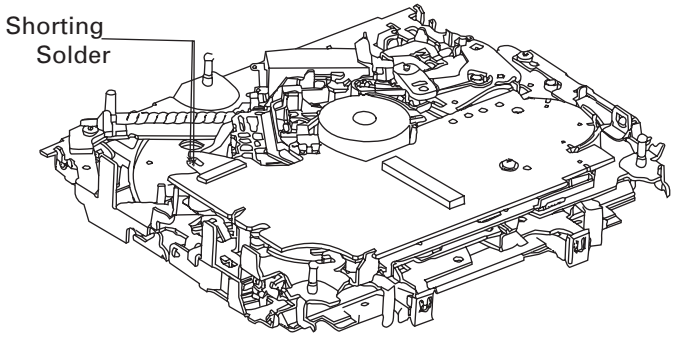
Caution: Before installing the carriage mechanism in the frames, be sure to apply some alcohol to the dampers and set the mechanism to the clamp mode.

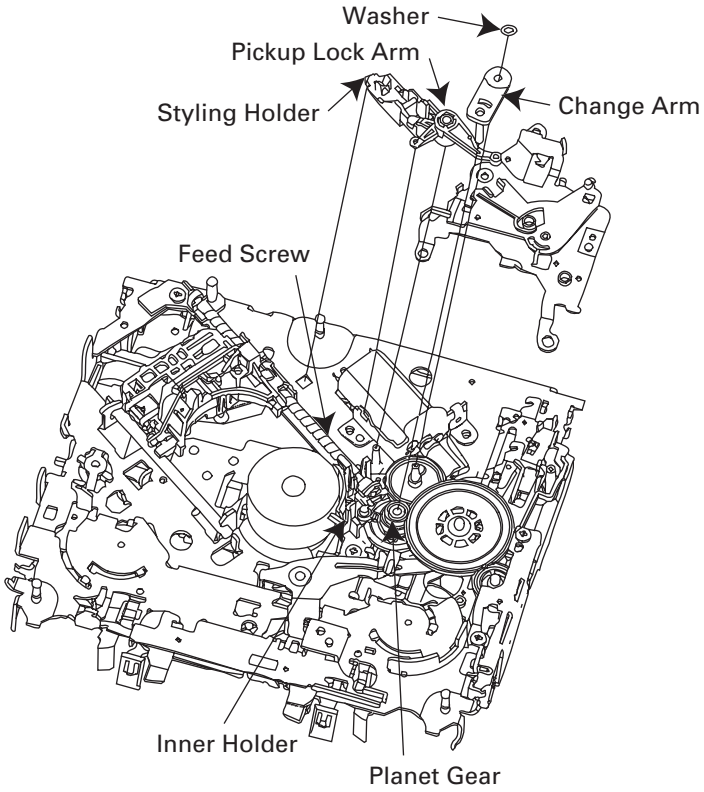


● Removing the Pickup Unit

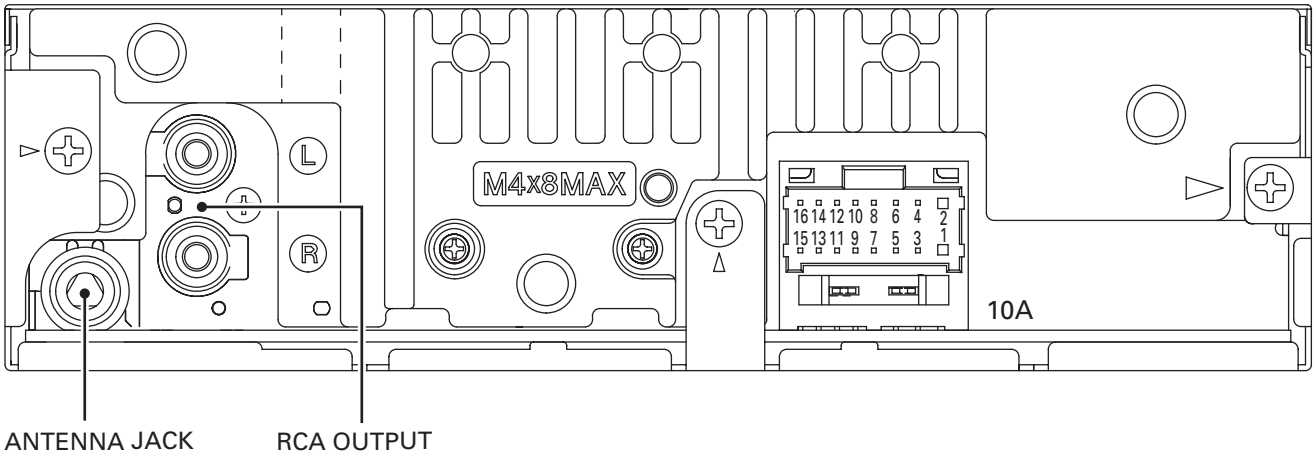
1. Apply shorting solder to the Pickup flexible cable. Disconnect the cable.
2. Set the mechanism to the clamp mode.
3. Remove the lead wires from the inner holder.
4. Remove the washer, styling holder, change arm, and pickup lock arm.
5. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.





7.1.2 CONNECTOR FUNCTION DESCRIPTION



Pin No.		Pin No.	
1	B.UP	9	RL-
2	GND	10	FL-
3	ACC	11	RL+
4	NC	12	FL+
5	NC	13	RR-
6	B.REM	14	FR-
7	NC	15	RR+
8	NC	16	FR+

7.2 PARTS

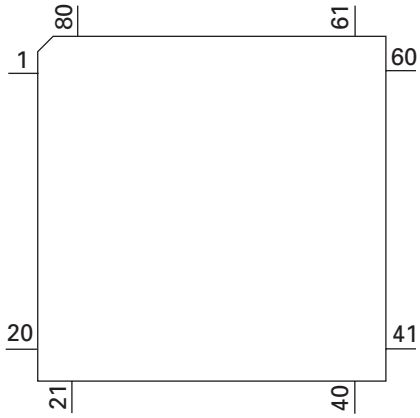
7.2.1 IC

● **Pin Functions(PE5447A)**

Pin No.	Pin Name	I/O	Function and Operation
1	MODEL1	I	Model select input
2, 3	NC		Not used
4	AVSS		GND
5, 6	NC		Not used
7	AVREF1		VDD
8	KYDT	I	Display microcomputer data input
9	DPDT	O	Display microcomputer communication data output
10	ADPW	O	A/D converter power supply output
11	TUNPDI	I	PLL data input
12	TUNPDO	O	PLL data output
13	TUNPCK	O	PLL clock output
14	PCL	O	Clock adjustment output
15	TESTIN	I	Test program input
16	BSI	I	P-BUS serial data input
17	BDATA	O	P-BUS serial data output
18	BSCK	I/O	P-BUS serial clock input/output
19, 20	NC		Not used
21	$\overline{\text{SWVDD}}$	O	Display microcomputer chip select output
22	ILMPW	O	Illumination power output
23	NC		Not used
24	XRST	O	CD LSI reset control output
25	XA0	O	CD LSI command data control output
26	XSTB	O	CD LSI strobe output
27	XTALEN	O	CD LSI ceramic oscillator oscillation output
28	CONT	O	Driver output
29	LOEJ	O	Load/eject output
30	CLCONT	O	Driver control output
31	NC		Not used
32	DALMON	O	Output for dark current reduction circuit
33	VSS		GND
34	$\overline{\text{BRST}}$	O	B-PUS reset signal output
35	$\overline{\text{BRXEN}}$	I/O	P-BUS reception enable signal input/output
36	NC		Not used
37	ROMDATA	O	ROM collection data output
38	ROMCLK	O	ROM collection clock output
39	ROMCS	O	ROM collection chip select output
40	RECEIVE	O	RDS decoder receiving output(Not used)
41	VDCONT	O	VD output
42	NC		Not used
43	SYSPW	O	System power output
44, 45	NC		Not used
46	STRKEY2	I	Wired remote control input
47	NC		Not used
48	MUTE	O	System mute output
49	ANTPW	O	Auto antenna control output
50	NC		Not used
51	VST	O	E.VOL strobe output
52	VDT	O	E.VOL data output
53	VCK	O	E.VOL clock output
54	NC		Not used
55	TUNPCE2	O	PLL chip enable output 2
56	TUNPCE	O	PLL chip enable output
57	RDT	I	RDS LK input(Not used)
58	RDSLK	I	RDS clock input(Not used)
59	RDS57K	I	RDS 57K input(Not used)
60	RESET		Reset
61	LDET	I	PLL lock detection input

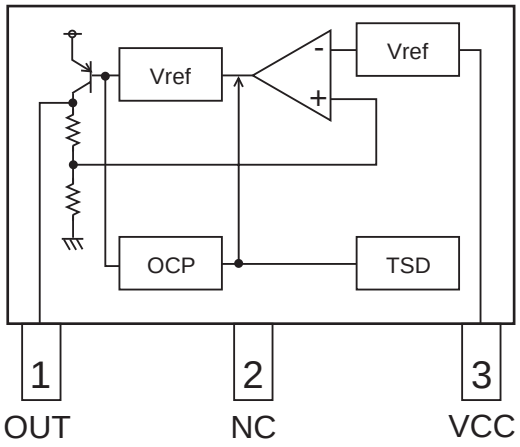
Pin No.	Pin Name	I/O	Function and Operation
62	RCK	I	RDS clock input
63	$\overline{\text{ASENS}}$	I	ACC sense input
64	$\overline{\text{BSENS}}$	I	Back up sense input
65	$\overline{\text{DSENS}}$	I	Grille detach sense input
66	$\overline{\text{SOURCE}}$	I	Source sense input
67	VSS		GND
68	VDD		VDD
69, 70	X2, 1		Crystal oscillator connection pin
71	IC(VPP)		GND
72	NC		Not used
73	VSS		VSS
74	AVDD		VDD
75	AVREF1		VDD
76	SL	I	Signal level input
77	TEMP	I	Temperature detection input
78	VDSENS	I	VD power supply short circuit input
79	$\overline{\text{BSRQ}}$	I	P-BUS serial pole request input
80	STRKEY1	I	Wired remote control input(Not used)

* PE5447A



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

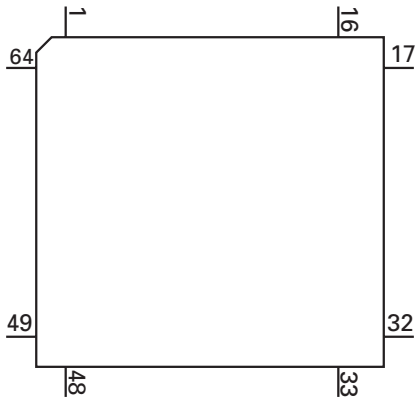
BA33BC0FP



● Pin Functions(PD6340A)

Pin No.	Pin Name	I/O	Function and Operation
1-5	SEG4-0	O	LCD segment output
6-9	COM3-0	O	LCD common output
10	VLCD		LCD drive power supply
11-14	KST3-0	O	Key strobe output
15,16	KDT0,1	I	Key data input (analogue input)
17	REW	I	Remote control reception input
18	DPDT	I	Display data input
19	NC		Not used
20	KYDT	O	Key data output
21	MODA		GND
22	X0		Crystal oscillator connection pin
23	X1		Crystal oscillator connection pin
24	VSS		GND
25,26	KDT2,3	I	Key data input
27	NC		Not used
28	KST4	O	Key strobe output
29-32	NC		Not used
33-55	SEG35-13	O	LCD segment output
56	VDD		Power supply
57-64	SEG12-5	O	LCD segment output

* PD6340A

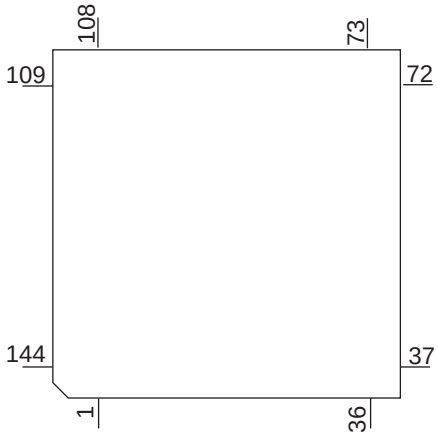


● Pin Functions(UPD63763GJ)

Pin No.	Pin Name	I/O	Function and Operation
1	D.VDD		Power supply for digital circuits
2	D1.GND		GND for 1.6V digital circuits
3	$\overline{\text{RESET}}$	I	Input of reset
4-8	AB12-8	I	Address bus 12-8 from the microcomputer
9-16	AD7-0	I/O	Address/data bus 7-0 to the microcomputer
17	$\overline{\text{CS}}$	I	Chip selection
18	ASTB	I	Address strobe
19	$\overline{\text{READ}}$	I	Control signals(read)
20	$\overline{\text{WRITE}}$	I	Control signals(write)
21	$\overline{\text{WAIT}}$	O	Control signals(wait)
22	INTQ	O	Interruption signals to the external microcomputer
23, 24	IFMODE0, 1	I	Switching the microcomputer I/F 0, 1
25	D1.VDD		Power supply for 1.6V digital circuits
26	DA.VDD		Power supply for DAC
27	ROUT	O	Output of audio for the right channel
28	DA.GND		GND for DAC
29	REGC		Connected to the capacitor for band gap
30	DA.GND		GND for DAC
31	LOUT	O	Output of audio for the left channel
32	DA.VDD		Power supply for DAC
33	X.VDD		Power supply for the crystal oscillator
34	XTAL	I	Connected to the crystal oscillator(16.9344MHz)
35	$\overline{\text{XTAL}}$	O	Connected to the crystal oscillator(16.9344MHz)
36	X.GND		Ground for the crystal oscillator
37	VDDREG15		Control of 1.6V regulator
38	PWMSW0	I	Setup 0 for PWM output(SD, MD)
39-41	TEST3-1	I	Connected to GND
42	PWMSW1	I	Setup 1 for PWM output(FD, TD)
43	TESTEN	I	Connected to GND
44	D1.GND		GND for 1.6V digital circuits
45	DIN	I	Input of audio data
46	DOUT	O	Output of audio data
47	SCKIN	I	Clock input for audio data
48	SCKO	O	Clock output for audio data
49	LRCKIN	I	Input of LRCK for audio data
50	LRCK	O	Output LRCK for audio data
51	$\overline{\text{XTALEN}}$	I	Permission to oscillate 16.9344MHz
52	D1.VDD		Power supply for 1.6V digital circuits
53	RFCK/HOLD	O	Output of RFCK/HOLD signal
54	WFCK/MIRR	O	Output of WFCK/MIRR signal
55	PLCK/RFOK	O	Output of PLCK/Output of RFOK
56	LOCK/RFOK	O	Output of LRCK/Output of RFOK
57	C1D1/C8M	O	Information on error correction/C8M : 8MHz
58	C1D2/C16M	O	Information on error correction/C16M : 16MHz
59	C2D1/RMUTE	O	Information on error correction/Mute for Rch
60	C2D2/LMUTE	O	Information on error correction/Mute for Lch
61	C2D3/SHOCK	O	Information on error correction/Detection of vibration
62	D1.GND		GND for 1.6V digital circuits
63	C33M	O	Output of 33.8688MHz(CLK for SDRAM)
64	($\overline{\text{RCS}}$)	O	DRAM $\overline{\text{CS}}$
65	RA11	O	Output of DRAM address 11
66	(CKE)	O	Output of DRAM CKE
67	$\overline{\text{RAS}}$	O	Output of DRAM $\overline{\text{RAS}}$
68	$\overline{\text{CAS0}}$(LDQM)	O	Output of DRAM lower $\overline{\text{CAS}}$(LDQM)
69	$\overline{\text{CAS1}}$(UDQM)	O	Output of DRAM upper $\overline{\text{CAS}}$(UDQM)
70	$\overline{\text{WE}}$	O	Output of DRAM $\overline{\text{WE}}$
71	$\overline{\text{OE}}$($\overline{\text{CAS}}$)	O	Output of DRAM $\overline{\text{OE}}$($\overline{\text{CAS}}$)
72	D.GND		Ground for digital circuits
73-88	RDB0-15	I/O	Input/output of DRAM data0-15
89-99	RA0-10	O	Output of DRAM address0-10

Pin No.	Pin Name	I/O	Function and Operation
100	D.VDD		Power supply for digital circuits
101	FD+	O	Output of focus drive PWM +
102	FD-	O	Output of focus drive PWM -
103	TD+	O	Output of tracking drive PWM +
104	TD-	O	Output of tracking drive PWM -
105	SD+	O	Output of thread drive PWM +
106	SD-	O	Output of thread drive PWM -
107	MD+	O	Output of spindle drive PWM +
108	MD-	O	Output of spindle drive PWM -
109	REFOUTSV	O	REFOUT for servo
110	AD.VDD		Power supply for ADC
111	EFM	O	Output of EFM signals
112	ASY	I	Input of asymmetry
113	ATEST	O	Analog tests
114	RFI	I	Input of RF
115	AD.GND		Ground for the analog system
116	AGCO	O	Output of RF
117	C3T	O	Connection to the capacitor for detecting 3T
118	AGCI	I	Input of AGC
119	RFO	O	Output of RF(AGC)
120, 121	EQ2, 1	I	Equalizer 2, 1
122	RF2-	I	Reversal input of RF2
123	RF-	I	Reversal input of RF
124	A.GND		Ground for the analog system
125	A	I	Input of A
126	C	I	Input of C
127	B	I	Input of B
128	D	I	Input of D
129	F	I	Input of F
130	E	I	Input of E
131	VREFIN	I	Input of reference voltage
132	A.VDD		Power supply for the analog system
133	REFOUT	O	Output of reference voltage
134	REFC	I	Connected to the capacitor for output of REFOUT
135	FE-	I	Reversal input of FE
136	FEO	O	Output of FE
137	ADIN	I	Input of FE, TE A/D converter
138	TE-	I	Reversal input of TE
139	TEO	O	Output of TE
140	TE2	O	TE2
141	TEC	I	TEC
142	LD	O	Output of LD
143	PD	I	Input of PD
144	D.GND		Ground for digital circuits

* UPD63763GJ

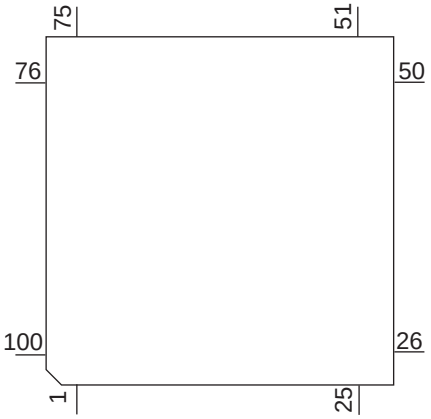


● Pin Functions(PE5454A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	AVREF			A power supply Positive power supply(5V)
2	AVSS			A power supply GND
3	RFOK	O	C	Output of state of RFOK
4	NC			Not used
5	EVDD			E power supply Positive power supply
6, 7	NC			Not used
8	IC/FLMD0			IC : VSS direct connection/FLMOD0 : Pull-down
9	VDD			Positive power supply(5V)
10	REGC			Connected to the capacity stabilizing output of the regulator
11	VSS			GND
12	X1	I		Oscillator connection for mainclock
13	X2			Oscillator connection for mainclock
14	$\overline{\text{RESET}}$	I		System reset input
15	XT1	I		Connected to the oscillator for subclock (connected to VSS via the resistor)
16	XT2			Connected to the oscillator for subclock(Open)
17	NC			Connected to EVDD or EVSS via the resistor
18	NC			Not used
19	$\overline{\text{XINT}}$		C	CD LSI interruption signal input
20	NC			Connected to VSS via the resistor
21	$\overline{\text{BRST}}$	I		P-Bus reset input
22	BSI	I		P-Bus serial data input
23	BSO	O	C	P-Bus serial data output
24	$\overline{\text{BSCK}}$	I/O	/C	P-Bus serial clock input/output
25	FTXD	O	C	For flash rewriting(transmitted signal)
26	FRXD	I		For flash rewriting(received signal)
27	BRXEN	I/O	/C	It is possible to receive P-Bus
28	$\overline{\text{BSRQ}}$	I/O	/C	P-Bus service request demand
29	NC			Not used
30	DSCSNS	I		Disc state sense input
31	8EJ(S905)	I		Input of detection of 8 cm disc ejection
32	12EJ(S904)	I		Input of detection of 12 cm disc ejection
33	EVSS			E power supply GND
34	EVDD			E power supply Positive power supply
35, 36	SRAMLEVEL0, 1	O	C	SRAM level meter output
37	EMPH	O	C	Emphasis information output
38	$\overline{\text{EMPH}}$	O	C	Emphasis information output
39-42	NC			Not used
43	$\overline{\text{ADENA}}$	O	C	A/D reference voltage supply control output
44	LRCKOK	O	C	(DOUT mute output)
45	SRAMLEVEL2	O	C	SRAM level meter output
46	CD3VON	O	C	CD +3.3V power supply control output
47	CONT	O	C	Servo driver power supply control output
48	$\overline{\text{XRST}}$	O	C	CD LSI reset control output
49	VDCONT	O	C	VD power supply control output
50	ROMDATA	I/O	/C	E2PROM data input/output
51	ROMCS	O	C	E2PROM chip selection output
52	ROMCK	O	C	E2PROM clock output
53	LOEJ	O	C	The direction change output of LOAD/EJECT
54	CLCONT	O	C	Driver input change output
55	CDMUTE	O	C	CD mute control output
56-58	NC			Not used
59	$\overline{\text{XCS}}$	O	C	CD LSI chip selection output
60	NC			Not used
61	$\overline{\text{XWAIT}}$	I		CD LSI write control signal output
62	CLKOUT	O	C	Internal system clock output(Open)
63	LOCK	I		Spindle lock input
64	NC			Not used
65	$\overline{\text{XWRITE}}$	O		CD LSI write control signal output
66	NC			Not used

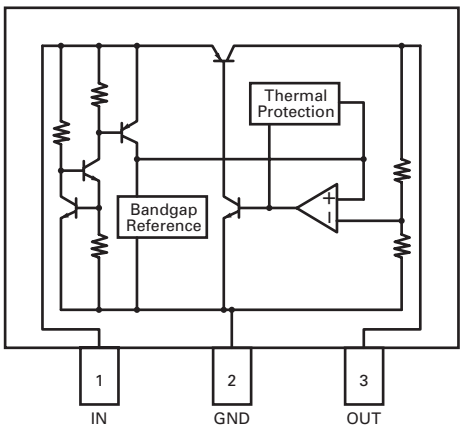
Pin No.	Pin Name	I/O	Format	Function and Operation
67	$\overline{\text{XREAD}}$	O		CD LSI read control signal output
68	XASTB	O		CD LSI address strobe output
69	BVSS			B power supply GND
70	BVDD			B power supply Positive power supply
71-83	AD0-12	I/O	/C	Address/data Bus 0-12
84-86	NC			Not used
87	FMODE	I		For flash rewriting Connected to VSS via the resistor
88	FLRQ	O	C	For flash rewriting
89-93	NC			Not used
94	$\overline{\text{CSENS}}$	I		Flap closing sense input
95	TYPE_A/D	I		CD-DA analog/digital output change setup
96	$\overline{\text{TESTIN}}$	I		Chip check test program starting input
97	HOME	I		Home SW sense input
98	TEMP			Temperature information sense input
99	VDSENS			VD power supply short sense input
100	NC			Not used

* PE5454A

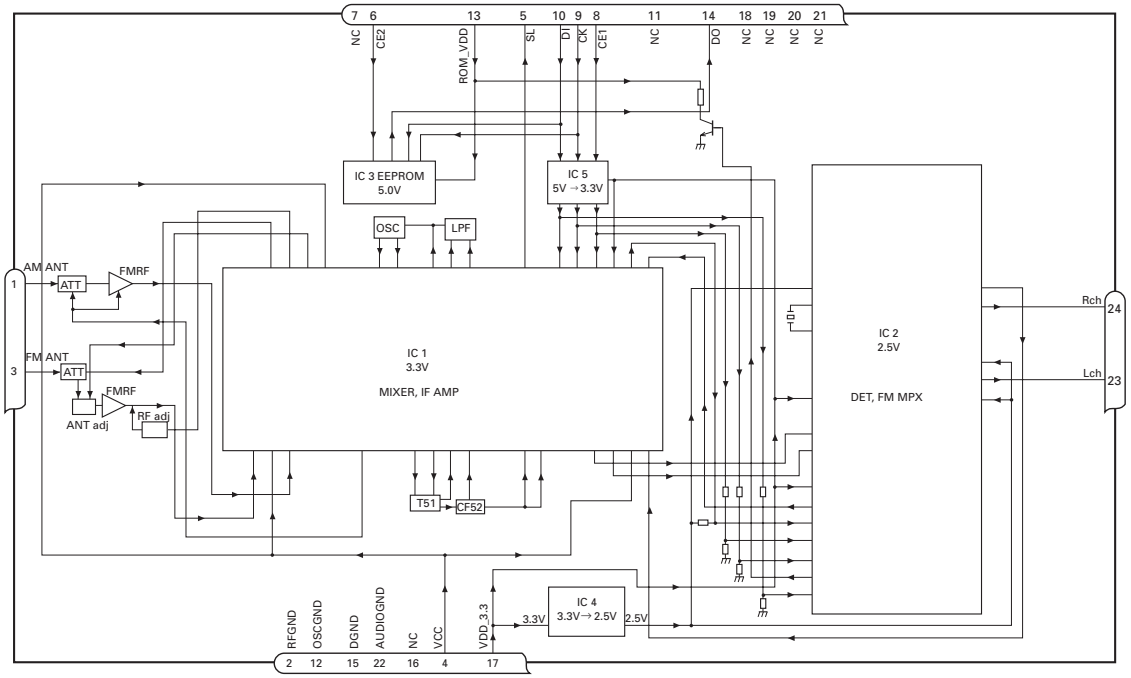


Format	Meaning
C	CMOS

NJM2885DL1-33



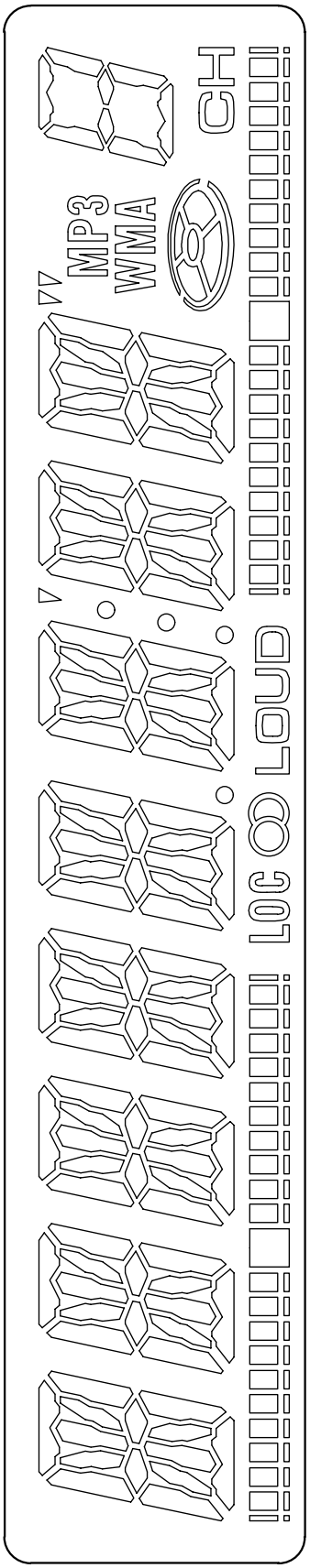
● FM/AM Tuner Unit



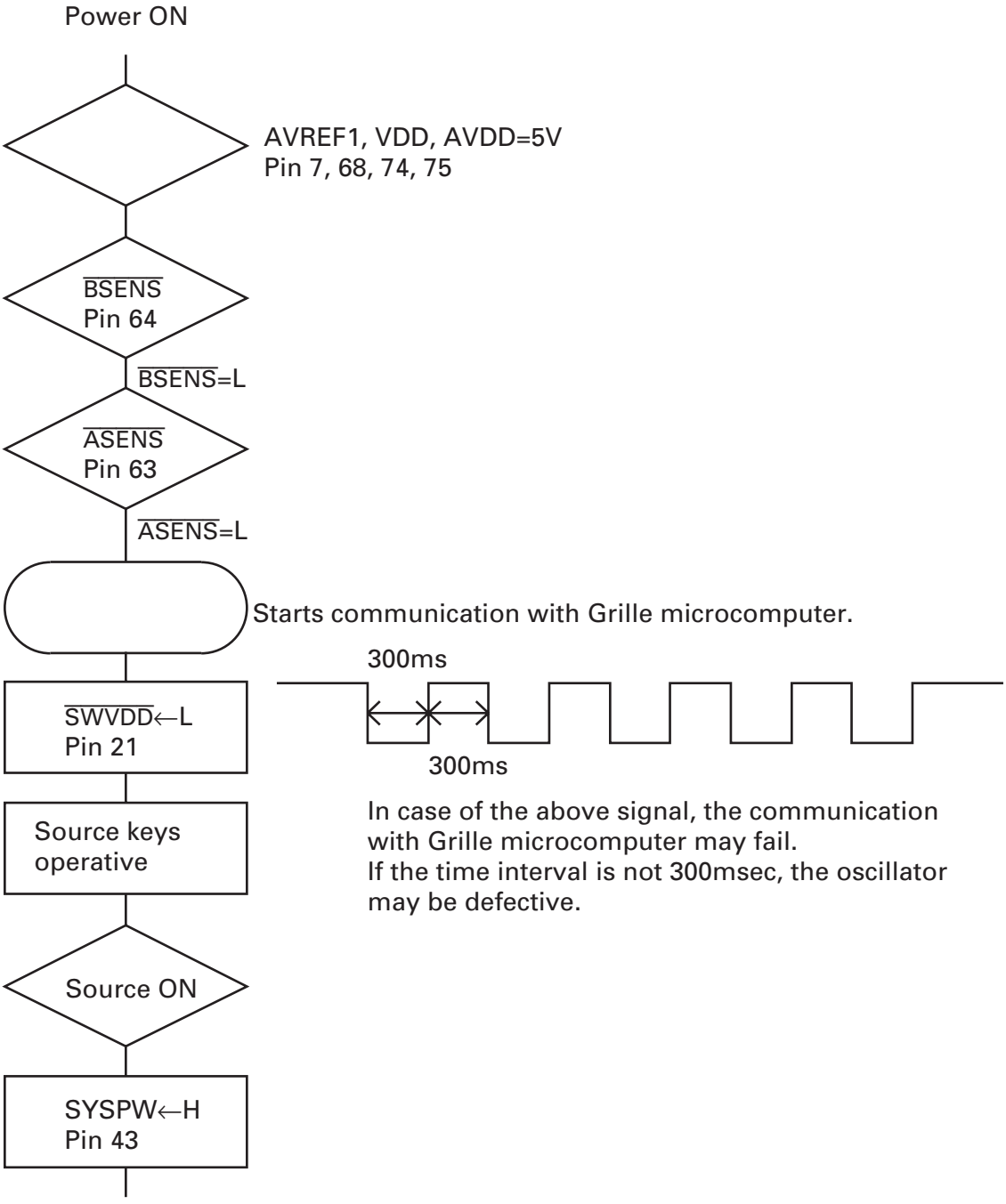
No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	NC		non connection	Not used
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V ± 0.2V
18	NC		non connection	Not used
19	NC		non connection	Not used
20	NC		non connection	Not used
21	NC		non connection	Not used
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

7.2.2 DISPLAY

● **LCD(CAW1848)**



7.3 OPERATIONAL FLOW CHART



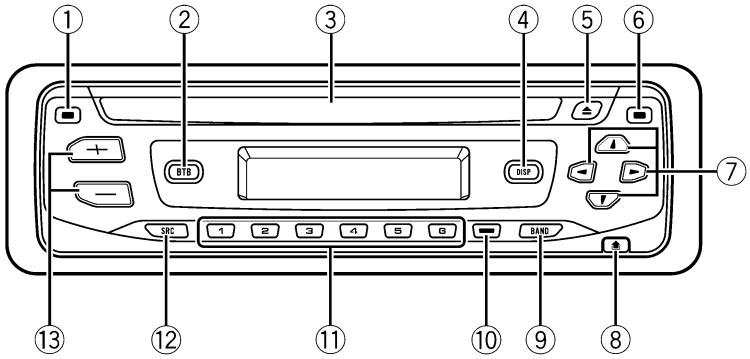
Completes power-on operation.(After that, proceed to each source operation.)

7.4 CLEANING

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

8. OPERATIONS



Head unit

① **CLOCK button**
Press to change to the clock display.

② **BTB button**
Press to select various BTB (bass treble booster) setting.
Press and hold to turn loudness on or off.

③ **Disc loading slot**
Insert a disc to play.

④ **DISPLAY button**
Press to select different displays.

⑤ **EJECT button**
Press to eject a CD from your built-in CD player.

⑥ **AUDIO button**
Press to select various sound quality controls.

⑦ **▲/▼/◄/► buttons**
Press to do manual seek tuning, fast forward, reverse and track search controls.
Also used for controlling functions.

⑧ **DETACH button**
Press to remove the front panel from the head unit.

⑨ **BAND button**
Press to select among three FM bands and one AM band and to cancel the control mode of functions.

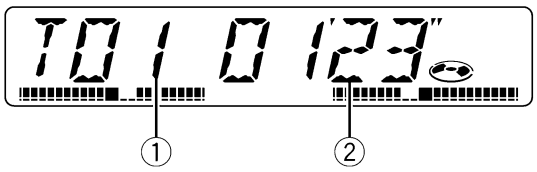
⑩ **LOCAL/BSM button**
Press to turn local function on or off.
Press and hold to turn BSM function on or off.

⑪ **1–6 buttons**
Press for preset tuning.

⑫ **SOURCE button**
This unit is turned on by selecting a source.
Press to cycle through all the available sources.

⑬ **VOLUME (+/–) buttons**
Press to increase or decrease the volume.

Playing a CD



① **Track number indicator**
Shows the track currently playing.

② **Play time indicator**
Shows the elapsed playing time of the current track.

1 Insert a CD into the CD loading slot.
Playback will automatically start.
- **Be sure to turn up the label side of a disc.**
- After a CD has been inserted, press **SOURCE** to select the built-in CD player.
- You can eject a CD by pressing **EJECT**.

2 Use VOLUME to adjust the sound level.

3 To perform fast forward or reverse, press and hold ◄ or ►.
- If you select **ROUGH**, pressing and holding ◄ or ► enables you to search every 10 tracks in the current disc.

4 To skip back or forward to another track, press ◄ or ►.
Pressing ► skips to the start of the next track. Pressing ◄ once skips to the start of the current track. Pressing again will skip to the previous track.

Notes
- The built-in CD player plays one, standard, 12-cm or 8-cm (single) CD at a time. Do not use an adapter when playing 8-cm CDs.
- Do not insert anything other than a CD into the CD loading slot.
- If an error message such as **ERROR-11** is displayed. ▣

Repeating play

Repeat play lets you hear the same track over again.

● **Press 5 repeatedly to turn repeat play on or off.**
When repeat play is on, **RPT** appears in the display.
- If you perform track search or fast forward/reverse, repeat play is automatically cancelled. ▣

Playing tracks in a random order

Random play lets you play back tracks on the CD in a random order.

● **Press 4 repeatedly to turn random play on or off.**
When random play is on, **RDM** appears in the display. ▣

Scanning tracks of a CD

Scan play lets you hear the first 10 seconds of each track on the CD.

1 Press 3 to turn scan play on.
SCAN appears in the display. The first 10 seconds of each track is played.

2 When you find the desired track press 3 to turn scan play off.

- After scanning of a CD is finished, normal playback of the tracks will begin again.

Pausing CD playback

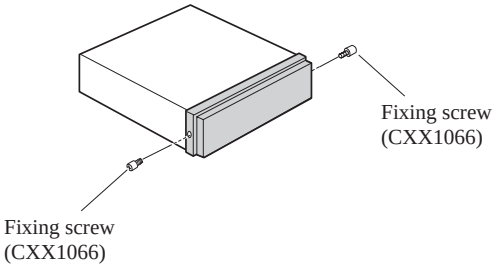
Pause lets you temporarily stop playback of the CD.

● **Press 6 repeatedly to turn pause on or off.**

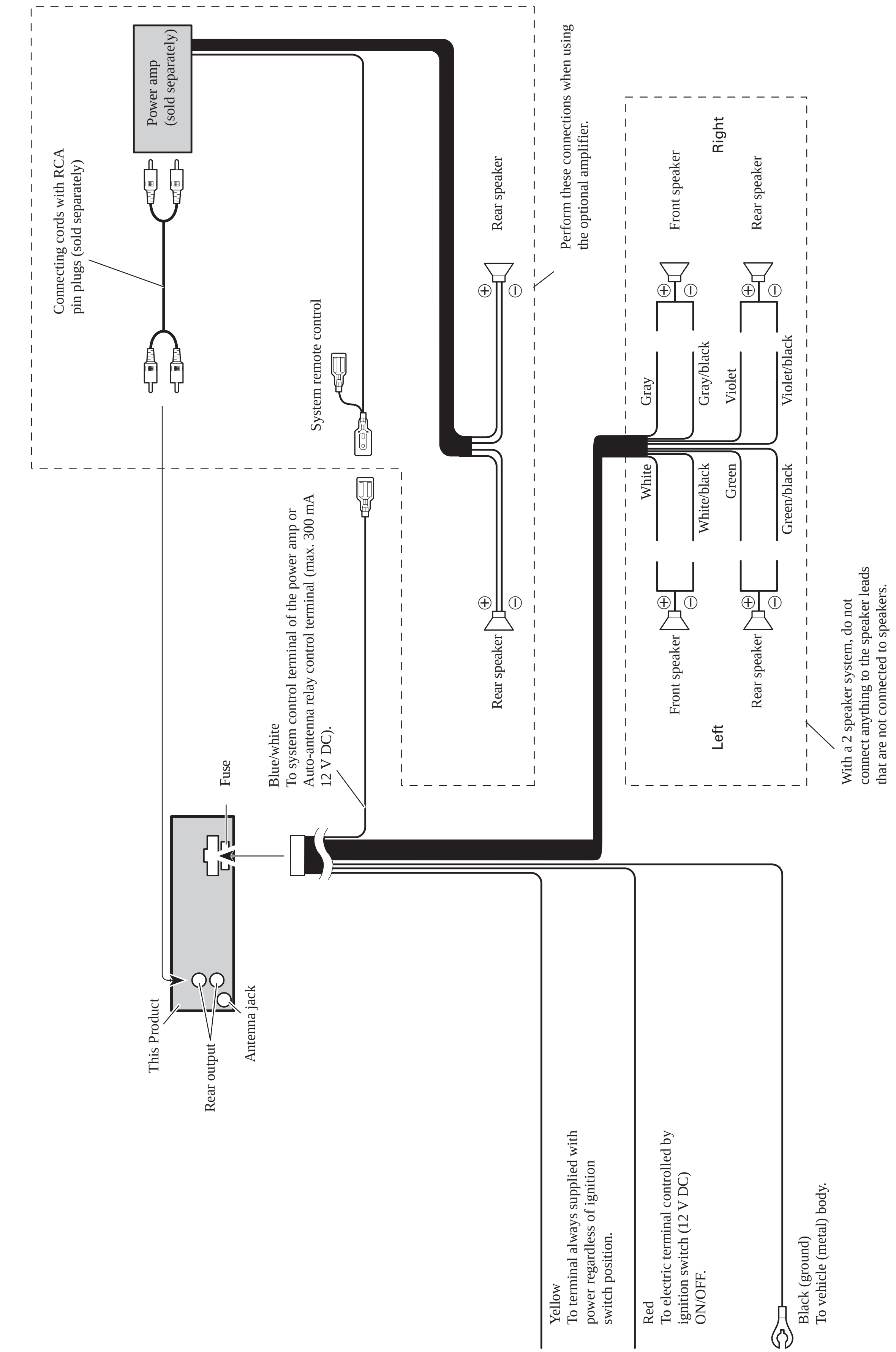
When pause is on, **PAUSE** appears in the display.

About the fixing screws for the front panel

If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.



● Connection Diagram



● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT3394

CD MECHANISM MODULE(S10.1AAC)

CX-3158

- **This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.**
- **When performing repairs use this manual together with the specific manual for model under repair.**

Model	Service Manual	CD Mechanism Module
DEH-P770MP/XN/UC	CRT3333	CXK5617
DEH-P7700MP/XN/EW	CRT3334	CXK5663
DEH-P670MP/XN/UC	CRT3335	CXK5663
DEH-3730MP/XN/EW	CRT3395	CXK5663
DEH-3700MP/XN/EW		
DEH-2750MP/XN/GS	CRT3396	CXK5663
DEH-2790MP/XN/ID		
DEH-2770MP/XN/CS		
DEH-3700MP/XU/UC	CRT3397	CXK5668
DEH-4700MP/XU/EW	CRT3398	CXK5668
DEH-4700MPB/XU/EW		
DEH-3750MP/XU/GS	CRT3399	CXK5668 CXK5669
DEH-3770MP/XU/CS		
DEH-3750MP/XU/CN		
DEH-P470MP/XM/UC	CRT3400	CXK5668
DEH-P4700MP/XM/UC		
DEH-P4750MP/XM/GS	CRT3401	CXK5668
DEH-P4790MP/XM/ID		
DEH-P4770MP/XM/CS		
DEH-P3700MP/XU/UC	CRT3402	CXK5668

CONTENTS

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PIONEER EUROPE NV Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZA. DEC. 2004 Printed in Japan

1. CIRCUIT DESCRIPTIONS

Recently, most CD LSI's have included DAC, RF amplifier and other peripheral circuits, as well as the core circuit DSP. This series of mechanisms employ a multi-task LSI UPD63763GJ, which has CD-ROM decoder and MP3/WMA decoder in addition to the CD block as shown in the Fig.1.0.1. This enables to reproduce a CD-ROM where MP3/WMA data is recorded.

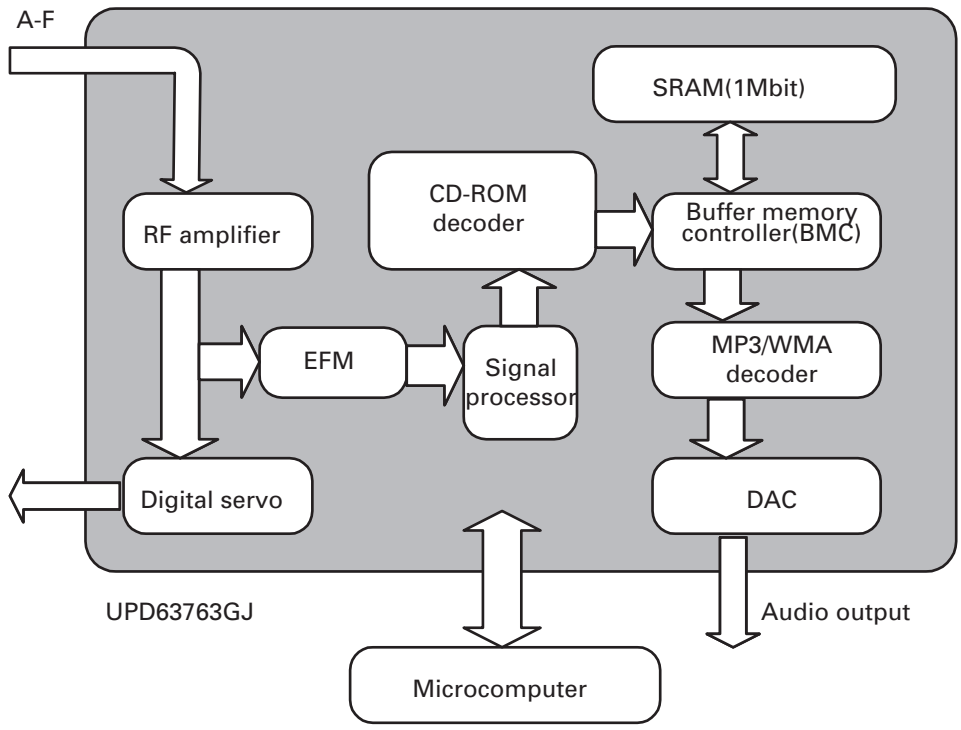


Fig.1.0.1 Block diagram of CD LSI UPD63763GJ

1.1 PREAMPLIFIER BLOCK (UPD63763GJ: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used for the next-stage blocks: the servo block, demodulator, and control.

After I/V-converted by the preamplifier with built-in photo detectors (inside the pickup), the signals are applied to the preamplifier block in the CD LSI UPD63763GJ (IC201). After added by the RF amplifier in this block, these signals are used to produce necessary signals such as RF, FE, TE, and TE zero-cross signals.

The CD LSI employs a single power supply system of + 3.3V. Therefore, the REFO (1.65V) is used as the reference voltage both for this CD LSI and the pickup. The LSI produces the REFO signal by using the REFOUT via the buffer amplifier and outputs from the pin 133. All the measurements should be made based on this REFO.

Caution: Be careful not to short the REFO and GRD when measuring.

1.1.1 APC (Automatic Power Control)

A laser diode has extremely negative temperature characteristics in optical output at constant-current drive. To keep the output constant, the LD current is controlled by monitor diodes. This is called the APC circuit. The LD current is calculated at about 30mA, which is the voltage between LD1 and V3R3D divided by 7.5 (ohms).

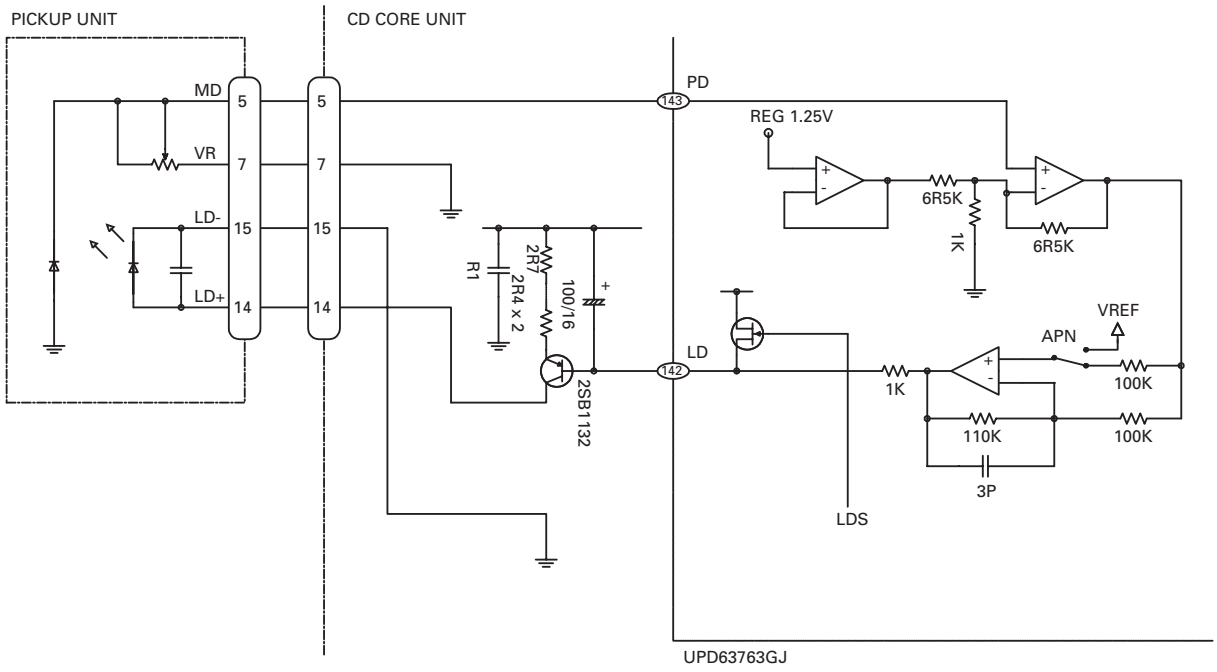


Fig. 1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The photo-detector outputs (A + C) and (B + D) are added, amplified, and equalized inside this LSI, and then provided as the RF signal from the RFI terminal. The RF signal can be used for eye-pattern check.

The low frequency component of the RFO voltage is:

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFI output from the pin 119 is A/C-coupled outside this LSI, and returned to the pin 118 of this LSI. The signal is amplified in the RFAGC amplifier to obtain the RFAGC signal. This LSI is equipped with the RFAGC auto-adjustment function as explained below. This function automatically controls the RFO level to keep at 1.5V by switching the feed-back gain for the RFAGC amplifier.

The RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

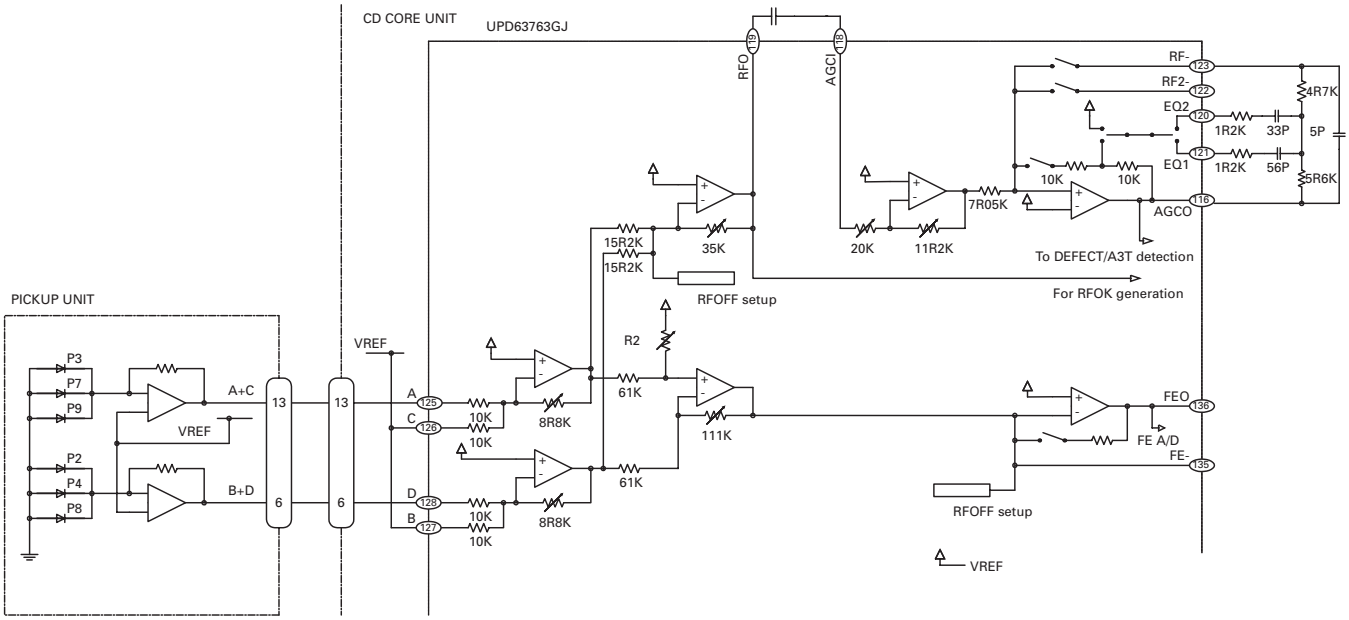


Fig. 1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are applied to the differential amplifier and the error amplifier to obtain the (A + C - B - D) signal, which is then provided from the pin 91 as the FE signal.
The low frequency component of the FE voltage is:
FE = (A + C - B - D) x 8.8/10k x 111k/61k x 160k/72k
= (A + C - B - D) x 3.5
The FE output shows 1.5Vp-p S-shaped curve based on the REFO. For the next-stage amplifiers, the cutoff frequency is 14.6kHz.

1.1.4 RFOK

The RFOK circuit generates the RFOK signal, which indicates focus-close timing and focus-close status during the play mode, and outputs from the pin 55. This signal is shifted to "H" when the focus is closed and during the play mode.
The DC level of the RFI signal is peak-held in the digital block and compared with a certain threshold level to generate the RFOK signal. Therefore, even on a non-pit area or a mirror-surface area of a disc, the RFOK becomes "H" and the focus is closed.
This RFOK signal is also applied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and RF amplifier gain switching.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are applied to the differential amplifier and the error amplifier to obtain the (E - F) signal, and then provided from the pin 136 as the TE signal.
The low frequency component of the TE voltage is:
TEO = (E - F) x 63k/112k x 160k/160k x 181k/45.4k x 160k/80k
= (E - F) x 4.48
The TE output provides the TE waveform of about 1.3Vp-p based on the REFO. For the next-stage amplifiers, the cutoff frequency is 21.1kHz.

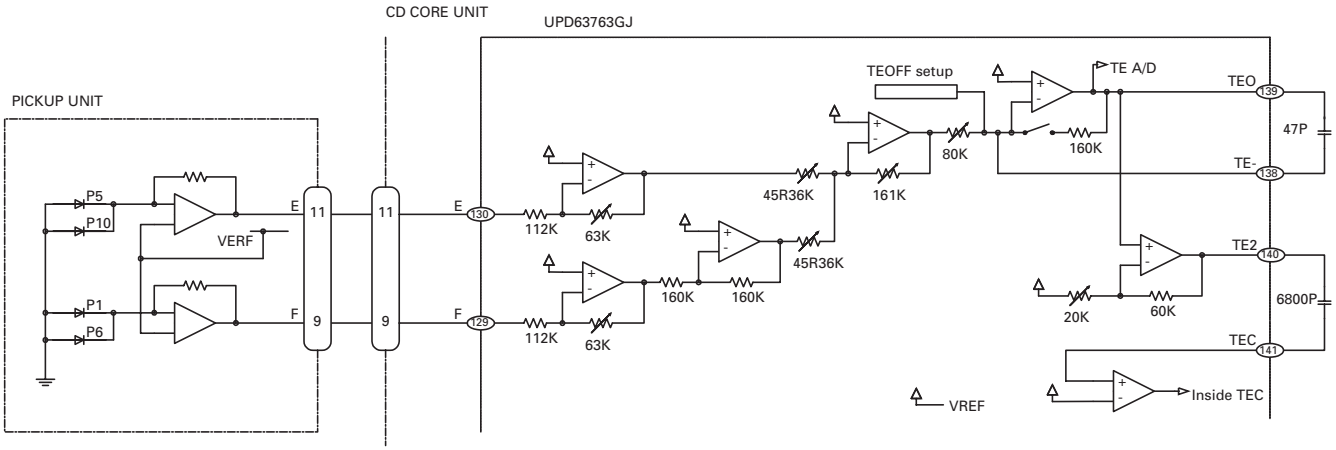


Fig. 1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter TEC signal) is obtained by amplifying the TE signal 4 times, and used to detect the tracking-error zero-cross point.

By using the information on this point, the following two operations can be performed:

1. Track counting in the carriage move and track jump modes
2. Sensing the lens-moving direction at the moment of the tracking close (The sensing result is used for the tracking brake circuit as explained below.)

The frequency range of the TEC signal is between 300Hz and 20kHz.

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62V. This level exceeds the D range of the operational amplifier, and the signal gets clipped. However, it can be ignored because the CD LSI only uses the signal at the zero-cross point.

1.1.7 EFM

The EFM circuit converts the RF signal into a digital signal expressed in binary digits 0 and 1. The AGCO output from the pin 116 is A/C-coupled in the peripheral circuit, fed back to the LSI from the pin 114, and sent to the EFM circuit inside the LSI.

On scratched or dirty discs, part of the RF signal recorded may be missing. On other discs, part of the RF signal recorded may be asymmetric, which was caused by dispersion in production quality. Such lack of information cannot be completely eliminated by this AC coupling process. Therefore, by utilizing the fifty-fifty occurrence ratio of binary digits (0 and 1) in the EFM signal, the EFM comparator reference voltage ASY is controlled, so that the comparator level always stays around the center of the RFO signal. The reference voltage ASY is made from the EFM comparator output via the low-pass filter. The EFM signal is put out from the pin 111.

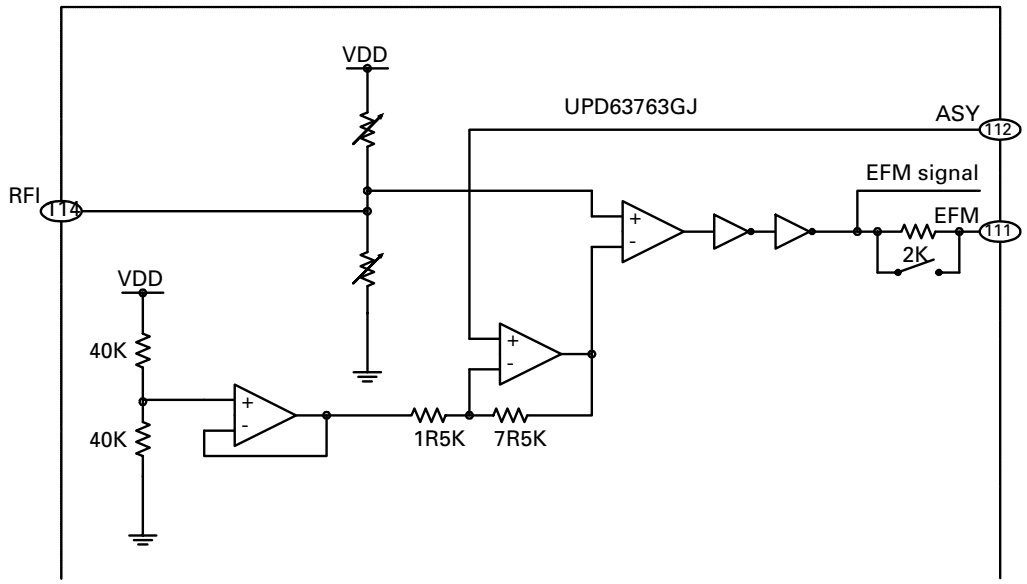


Fig. 1.1.4 EFM

1.2 SERVO BLOCK (UPD63763GJ: IC201)

The servo block controls the servo systems for error signal equalizing, in-focus, track jump and carriage move and so on. The DSP block is a signal-processing block, where data decoding, error correction, and compensation are performed.

After A/D-converted, the FE and TE signals (generated in the preamplifier block) are applied to the servo block and used to generate the drive signals for the focus, tracking, and carriage servos.

The EFM signal is decoded in the DSP block, and finally sent out as the audio signal after D/A-converted. In this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to generate the spindle drive signal.

The drive signals for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are provided as PWM3 data, and then converted to the analog data by the low-pass filter embedded in the driver IC BA5835FP (IC301). These analog drive signals can be monitored by the FIN, TIN, CIN, and SIN signals respectively. Afterwards, the signals are amplified and applied to each servo's actuator and motor.

1.2.1 Focus servo system

In the focus servo system, the digital equalizer block works as its main equalizer. The figure 1.2.1 shows the block diagram of the focus servo system.

To close the focus loop circuit, the lens should be moved to within the in-focus range. While moving the lens up and down by using the focus search triangular signal, the system tries to find the in-focus point. In the meantime, the spindle motor rotation is kept at the prescribed one by using the kick mode.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus close operations at an appropriate timing. The focus loop will close when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.
2) The RFOK signal is shifted to "H".
3) The FE signal is zero-crossed. At last, the FE signal comes to the zero level (or REFO).

When the focus loop is closed, the FSS bit is shifted from "H" to "L". The microcomputer starts monitoring the RFOK signal obtained through the low-pass filter 10msec after that.

If the RFOK signal is detected as "L", the microcomputer will take several actions including protection.

The timing chart for focus close operations is shown in fig. 1.2.2.

(This shows the case where the system fails focus close.)

In the test mode, the S-shaped curve, search voltage, and actual lens movement can be confirmed by pressing the focus close button when the focus mode selector displays 01.

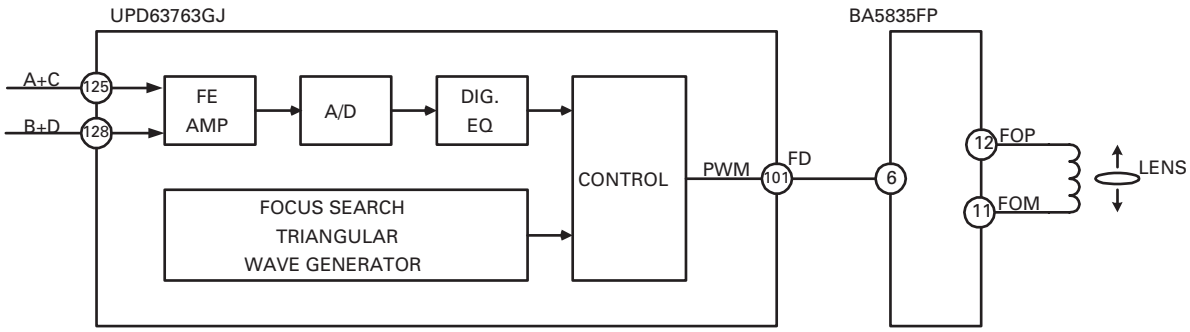


Fig. 1.2.1 Block diagram of the focus servo system

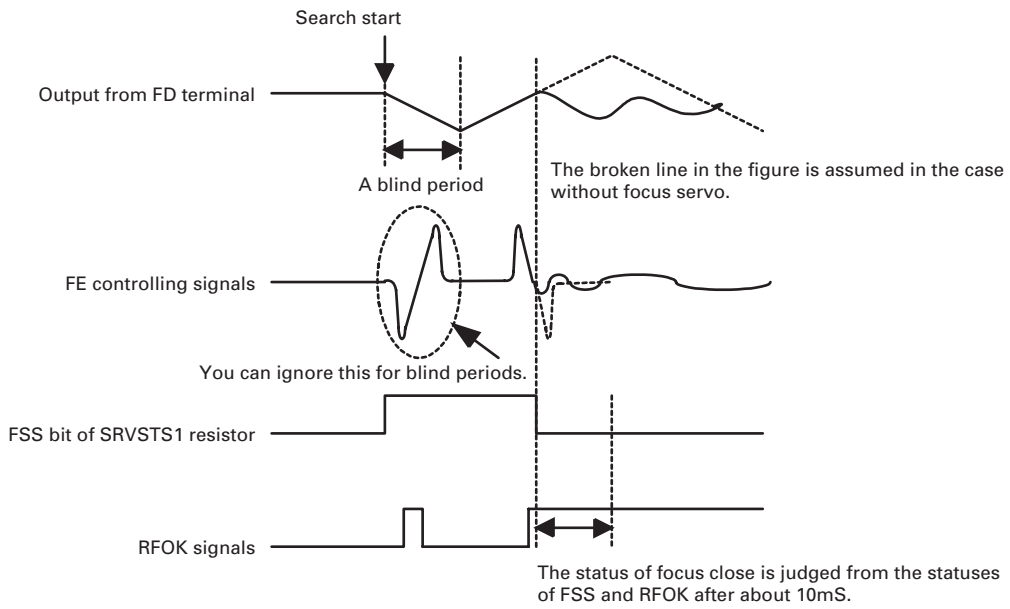


Fig. 1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

In the tracking servo system, the digital equalizer block is used as its main equalizer. The figure 1.2.3 shows the block diagram of the tracking servo system.

(a) Track jump

Track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the microcomputer. In the search mode, the following track jump modes are available: 1, 4, and 100

In the test mode, 1, 32, and 32*3 track jump modes, and carriage move mode are available and can be switched by selecting the mode.

For track jumps, first, the microcomputer sets about half the number of tracks to be jumped as the target. (Ex. For 10 track jumps, it should be 5 or so.) Using the TEC signal, the microcomputer counts up tracks. When the counter reaches the target set by the microcomputer, a brake pulse is sent out to stop the lens. The pulse width is determined by the microcomputer. Then, the system closes the tracking loop and proceeds to the normal play. At this moment, to make it easier to close the tracking loop, the brake circuit is kept ON for 50msec after the brake pulse, and the tracking servo gain is increased.

In the normal operation mode, the FF/REW operation is realized by continuously repeating single jumps about 10 times faster than the normal single jump operation.

(b) Brake circuit

The brake circuit stabilizes the servo-loop close operation even under poor conditions, especially in the setting-up mode or track jump mode. This circuit detects the lens-moving direction and emits only the drive signal for the opposite direction to slow down the lens. Thus, this makes it easier to close the tracking servo loop. The off-track direction is detected from the phases of the TEC and MIRR signals.

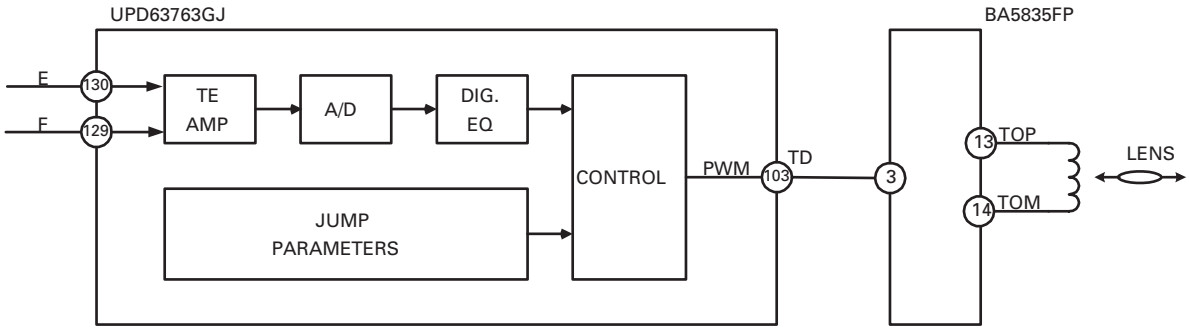


Fig. 1.2.3 Block diagram of the tracking servo system

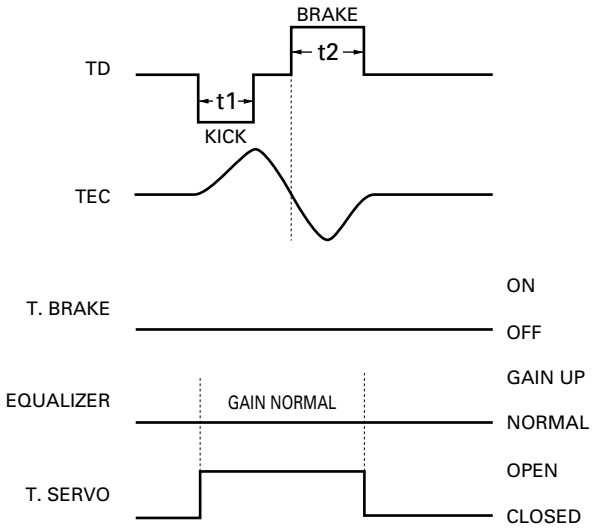


Fig. 1.2.4 Single-track jump

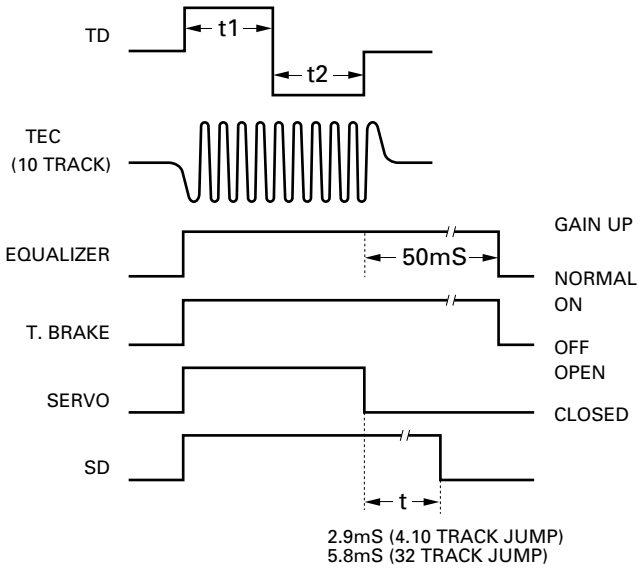
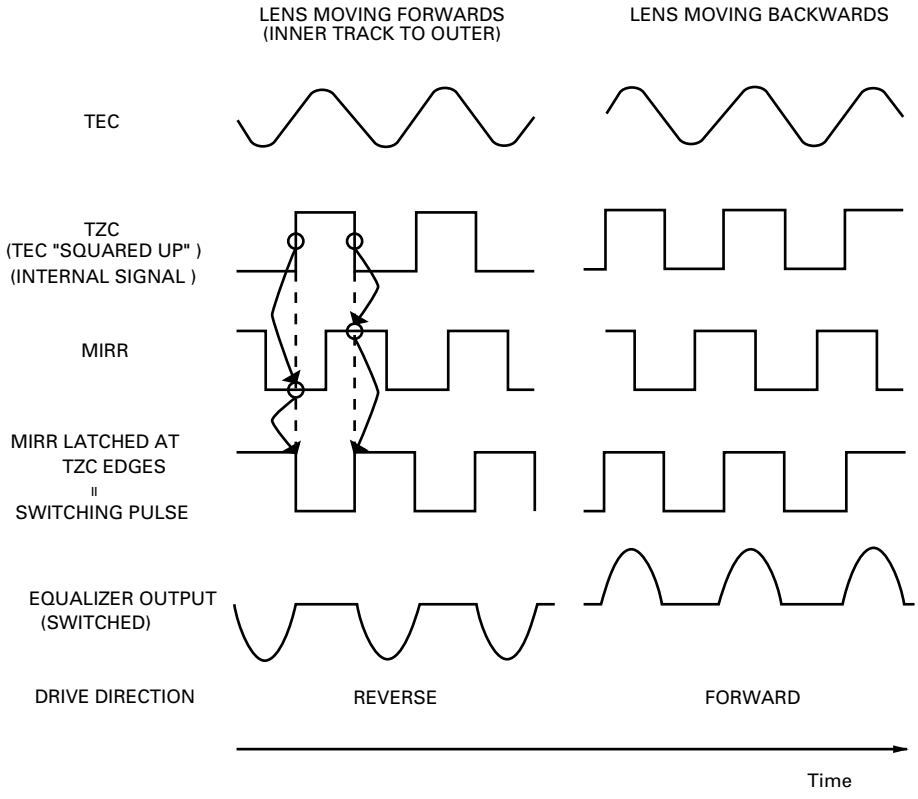


Fig. 1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig. 1.2.6 Track brake

1.2.3 Carriage servo system

In the carriage servo system, the low frequency component from the tracking equalizer (the information on the lens position) is transferred to the carriage equalizer, where the gain is increased to a certain level, and then sent out from the LSI as the carriage drive signal. This signal is applied to the carriage motor via the driver IC.

During the play mode, when the lens offset reaches a certain level, it is necessary to move the pickup toward the FORWARD direction. The equalizer gain is adjusted so that the output over the carriage motor starting voltage is sent out in such a case. In actual operations, only when the equalizer output exceeds the threshold level preset in the servo LSI, the drive signal is sent out. This can reduce the consumption power.

With an eccentric disc loaded, before the whole pickup starts moving, the equalizer output may exceed the threshold level a few times. In this case, the drive signal applied from the LSI shows pulse-like waveforms.

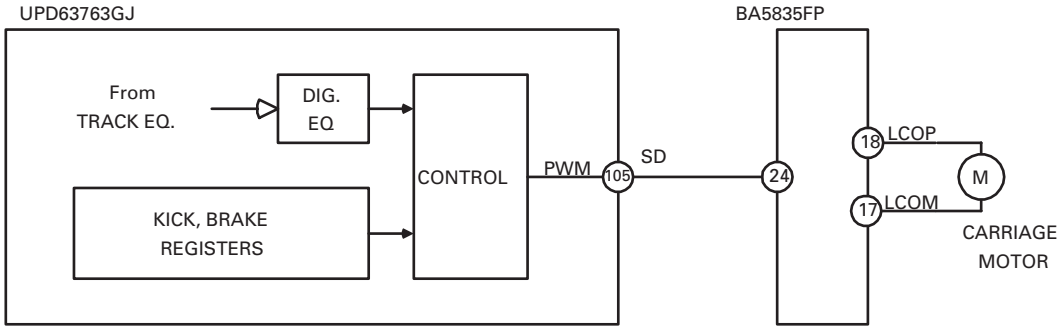


Fig. 1.2.7 Block diagram for the carriage servo block

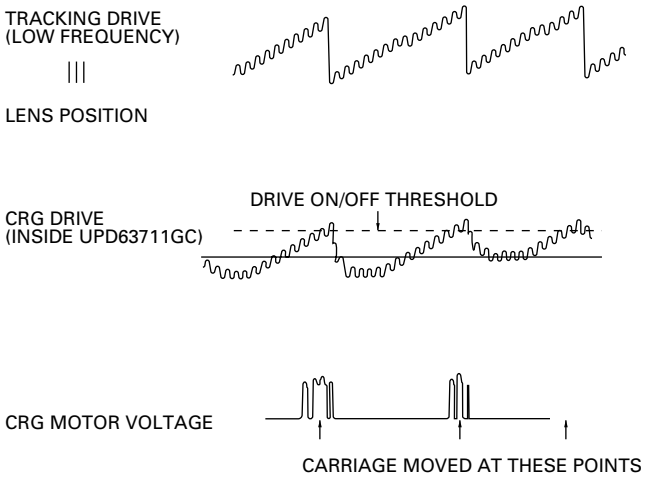


Fig. 1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following seven modes are available:

1) Kick

Used to accelerate the disc rotation in the setting-up mode.

2) Offset

a. Used in the setting-up mode until the TBAL adjustment completes after the kick mode.

b. Used when the focus loop is unlocked during the play mode and until it is locked again.

In both cases, the mode is to keep the disc rotation near to the appropriate one.

3) Applicable servo

In the normal operation, the CLV servo mode is used.

The EFM demodulation block detects through WFCK/16 sampling whether or not the frame sync signal and the internal frame counter output are synchronized, and generates the status signal based on the sampling result, synchronized or non-synchronized. If eight consecutive "non-sync" signals are obtained, the system senses the status as "non-sync". If not, the system senses as "sync". In the applicable servo mode, the leading-in servo mode is automatically selected at the non-sync status, and the normal servo mode is at the sync status.

4) Brake

Used to stop the spindle motor.

In accordance with the microcomputer's command, the brake voltage is sent out from the servo LSI. At this moment, the EFM waveform is being monitored in this LSI. When the longest EFM pattern exceeds a certain cycle (or the rotation slows down enough), a flag is set inside the LSI, and the microcomputer switches off the brake voltage. If a flag is not set within a certain period, the microcomputer shifts the mode from the brake mode to the stop mode, and keeps this for a certain period. In the eject mode, after the mode is shifted to the stop mode and a certain period passes, the loaded disc is ejected.

5) Stop

Used when the power is turned on and during the eject mode. At this moment, the voltage through the spindle motor is 0V.

6) Rough servo

Used when the carriage is moved (or in the carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, "H" or "L" is applied to the spindle equalizer. In the test mode, this mode is used for grating confirmation.

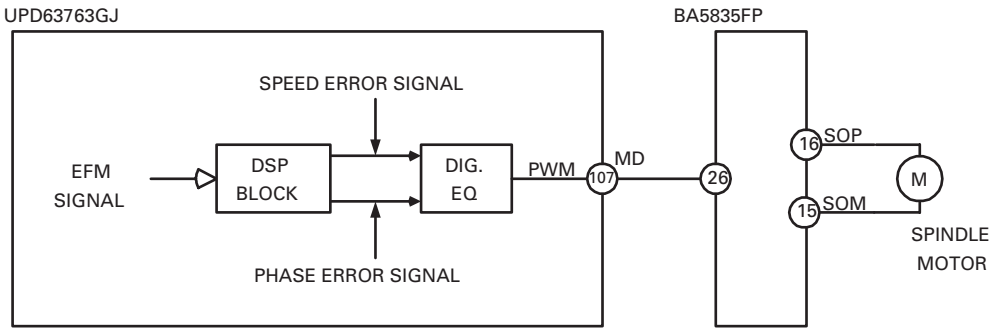


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

This system automatically handles the circuit adjustment inside the CD LSI. All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key. Each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

This adjustment is made to adjust the offsets of the TE, FE, and RF amplifiers in the preamplifier block to their target values on the basis of the REFO when the power is turned on. (The target values for TE, FE, and RE offsets are 0V, 0V, and -0.8V respectively.)

<Adjusting procedures>

1) With the LD OFF status, the microcomputer reads each offset through the servo LSI.

2) The microcomputer calculates the voltages for correction from the measured values, and inputs the calculated results as the offset adjustment values.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment is to equalize the pickup output offsets for E-ch and F-ch by changing the amplifier gain inside the LSI. Actually, the gain is adjusted so that the TE waveform becomes symmetrical on each side of the REFO.

<Adjusting procedures>

1) The focus loop is closed.

2) The lens is kicked in the radial direction to make certain that the TE waveform is generated.

3) The microcomputer reads the TE offset calculated in the LSI through the servo LSI.

4) The microcomputer takes either of the following steps depending on the calculated offset:

• When the offset is 0, the adjustment completes.

• When the offset is positive or negative, the amp gains for E-ch and F-ch should be changed.

The steps 2) to 4) are repeatedly taken until the offset becomes 0 or the repeating time reaches the limit frequency.

1.3.3 EF bias auto-adjustment

This adjustment obtains the best focus point during the play mode and maximizes the RFI level by utilizing the phase difference between the 3T level of the RF signal and that of the signal obtained when focus error disturbance is applied to the focus loop. At this moment, the auto-gain control (AGC), where focus error disturbance is applied to the focus and tracking loops, is also performed as explained below.

<Adjusting procedures>

1) The microcomputer transmits the command to apply disturbance component to the focus loop (inside the servo LSI).

2) In the LSI, the 3T-offset component of the RF signal is detected.

3) From the relation between the 3T detected component and the disturbance, the LSI obtains the volume and direction of the focus offset.

4) The microcomputer transmits the command and reads out the detecting result from the servo LSI.

5) The microcomputer calculates the necessary correction and inputs the result as the bias adjustment value to the servo LSI.

The adjusting steps are repeated a few times for higher adjustment accuracy as same as those for the AGC.

1.3.4 Focus and tracking AGC

This function automatically adjusts the focus and tracking servo loop gains.

<Adjusting procedures>

1) Disturbance component is applied to the servo loop.

2) The error signals (FE and TE) are extracted through the band pass filter as the G1 and G2 signals.

3) The microcomputer reads the G1 and G2 signals through the servo LSI.

4) The microcomputer calculates the necessary correction and performs the loop gain adjustment inside the servo LSI.

For higher adjustment accuracy, the above steps are repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment minimizes the dispersion of the RF level (RFO), which may be caused by disc-related errors, for more stable signal transmission by changing the amp gain between RFI and RFO.

<Adjusting procedures>

1) The microcomputer sends the command to the servo LSI to read out the output from the RF level detecting circuit inside the servo LSI.

2) The microcomputer calculates the appropriate amp gain by using the output read out to adjust the RFO level at the prescribed one.

3) The microcomputer sends the command to the servo LSI to adjust the amp gain into the calculated one.

This adjustment is automatically performed when:

1) During the setting-up mode, only the focus close operation ends.

2) Immediately before the setting-up ends (or right before the play mode starts)

1.3.6 Preamplifier gain adjustment

In this adjustment, when the reflected beams from disc surface are extremely weak (ex. when the lens is dirty, and a CD-RW is loaded), the whole gain in the RFAMP block (FE, TE, and RF amplifiers) is increased by +6dB or +12dB.

<Adjusting procedures>

When the system senses that the reflected beams from disc surface are extremely weak during the setting-up mode, the whole RFAMP gain is increased by +6dB or +12dB.

After the gain is changed, the setting-up mode is restarted.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are conducted from the initial value. Automatic adjustments by source change or ACC ON are conducted basically using the previous adjustment value as the initial value.

1.3.8 Adjustment result display

For some of the adjustments (FE and RF offset, FZD cancel, F and T gain, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

1) FE and RF offset

Reference coefficient = 32 ("32" indicates no adjustment required)

The display is expressed in the unit of about 32mV.

Ex. When the FE offset coefficient is 35:

35 - 32 = 3 x 32mV = 96mV

This means that the correction is about +96mV, and the FE offset before adjustment is -96mV.

2) F and T gain adjustment

Reference coefficient for focus and tracking = 20

The displayed coefficient / the reference coefficient indicates the adjusted gain.

Ex. When the AGC coefficient is 40:

40/20 = 2 times (+6dB)

That is, the gain was adjusted by +6dB.

(The original loop gain was half the target one. So, the whole gain was doubled.)

3) RF level adjustment (RFAGC)

Reference coefficient = 8

The coefficient 9 to 15 indicates increasing the RF level.

The coefficient 0 to 7 indicates decreasing the RF level.

When the coefficient display changes by 1, the gain changes by 0.7 to 1dB.

When the coefficient is 15, the gain is maximum or TYP + 7.9dB.

When the coefficient is 0, the gain is minimum or TYP - 4.6dB.

1.4 POWER SUPPLY AND LOADING BLOCK

The VD (7.5 ± 0.5V), the VD2 (7.5 ± 0.5V) and the VDD (5.0 ± 0.25V), which are supplied from the main unit, are used for the power supply. In this system, the following four power-supply signals are available: the VD (for the drive system), the V3R3 obtained from the VD2 via the 3.3V regulator (for the control system: 3.3V), the VDD (for the microcomputer: 5V), and the 3VDD obtained from the VDD via the 3.3V regulator (for the microcomputer: 3.3V).
ON/OFF of other than Load/Eject of CD driver and 5V ON/OFF are controlled by "CONT" and "CD5VON", respectively, with microcomputer. Loading drive ON/OFF is not equipped with a control terminal, but the input signal "LOEJ" has an equivalent role. LCO output switches LOADING MODE and CARRIAGE MODE by "CLCONT."

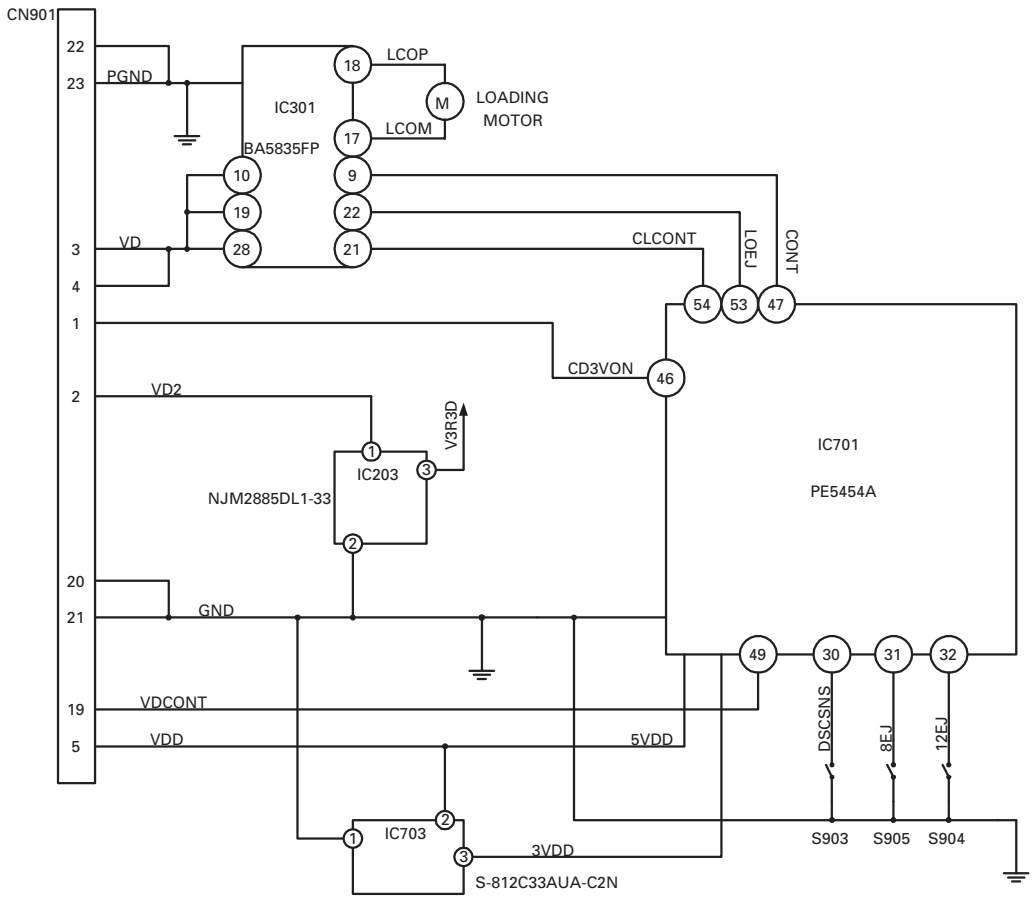


Fig. 1.4.1 Power supply/loading block

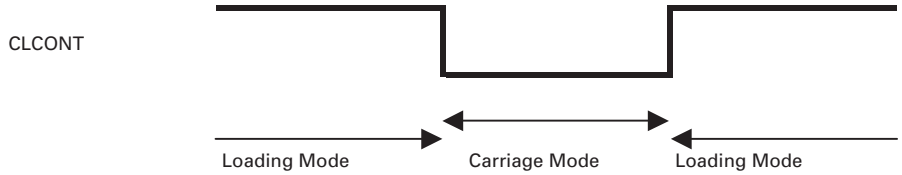
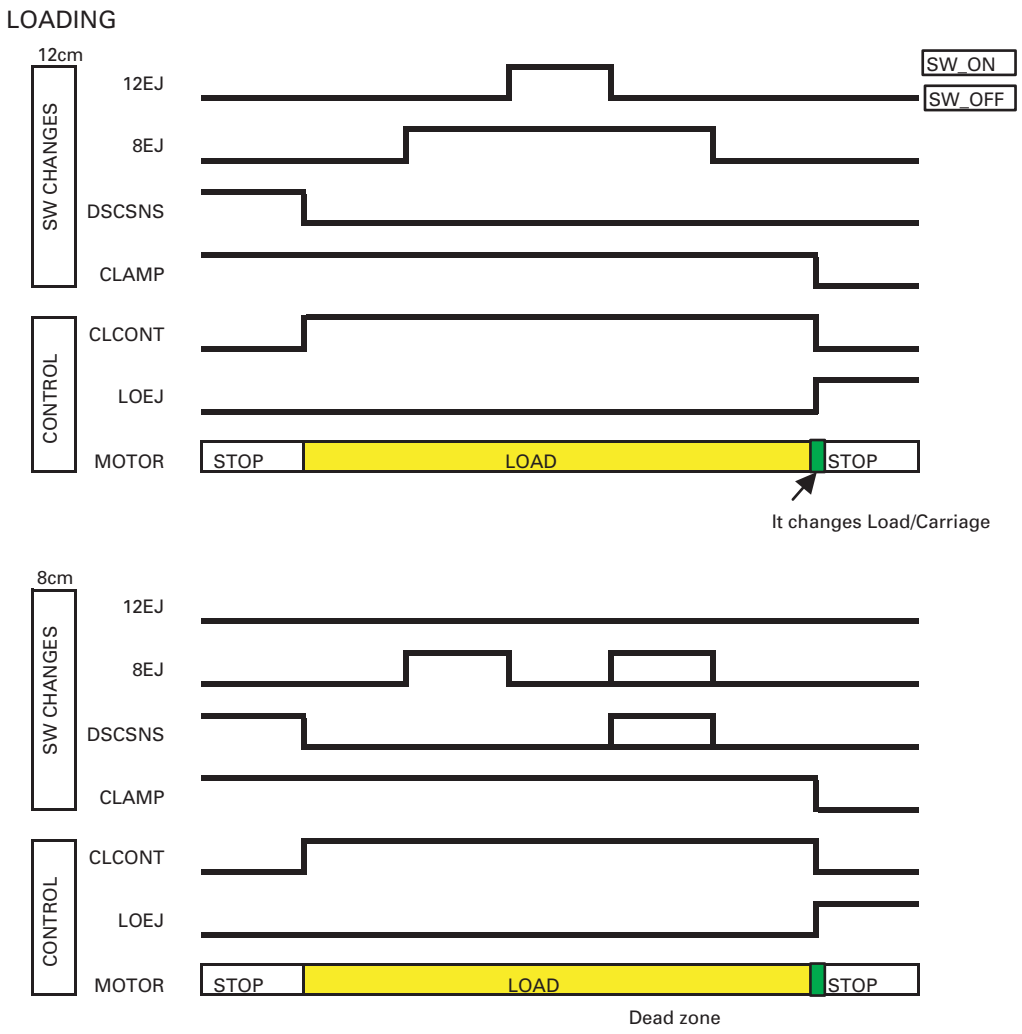


Fig. 1.4.2 Loading/carriage mode shift

To control the load and eject operations, the clamp switch located in the mechanism unit and the three detecting switches located in the control unit are used. Depending on the combination of these switches' ON/OFF status, the DSCSNS voltage changes.
The microcomputer can detect the status (A to E) by observing the voltage at the A/D port. The disc size detection (8 or 12cm) is also performed through this status change. The DSCSNS status and the status change in the load and eject modes are shown in the figures 1.4.3 and 1.4.4 respectively.

Status	A	B	C	D	E
SW1(S903)	ON	OFF	OFF	OFF	ON
SW2(S905)	OFF	OFF	ON	ON	OFF
SW3(S904)	OFF	OFF	OFF	ON	OFF
SW4(S901)	OFF	OFF	OFF	OFF	ON
Mechanism state	With no disk				Clamp state

Fig.1.4.3 DSCSNS status



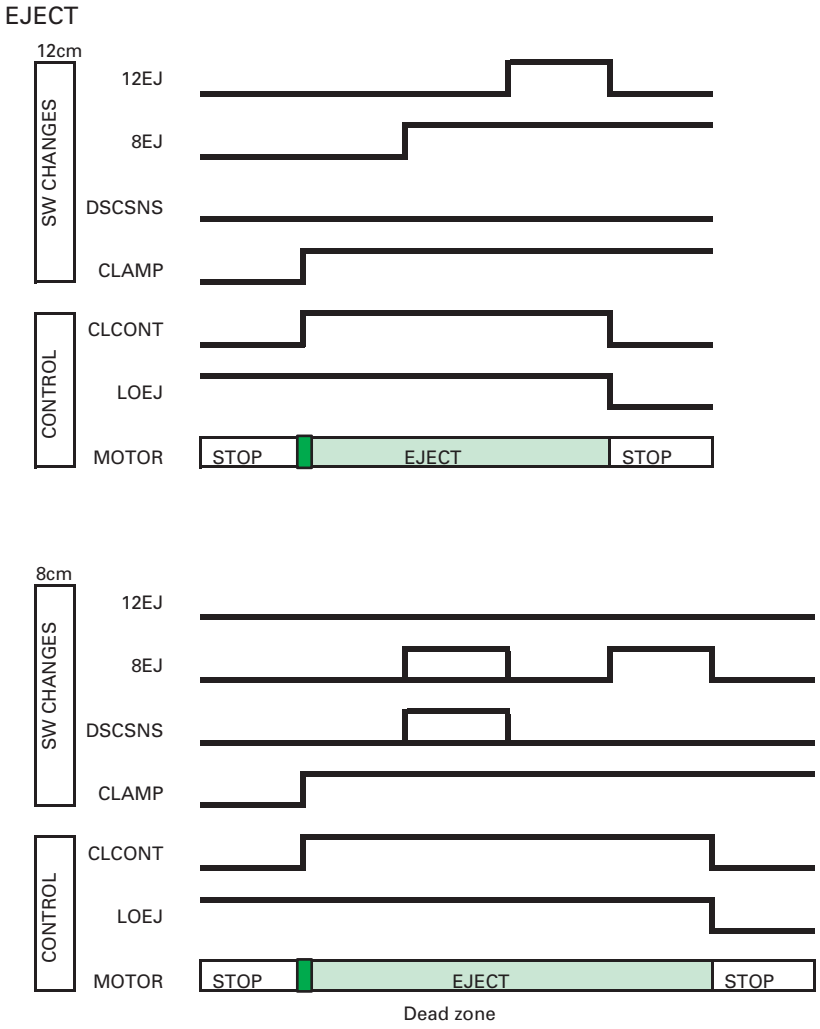
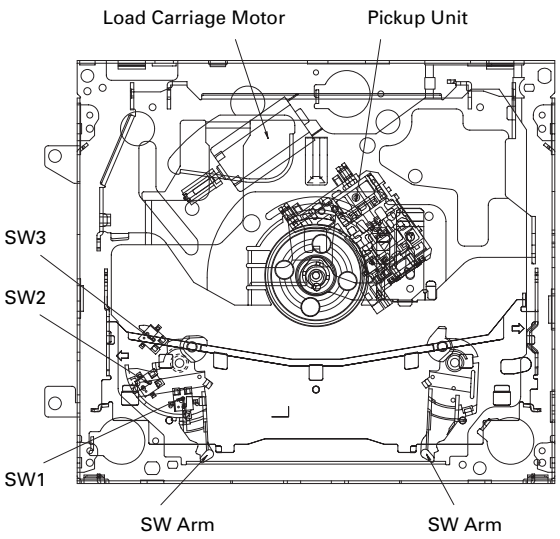


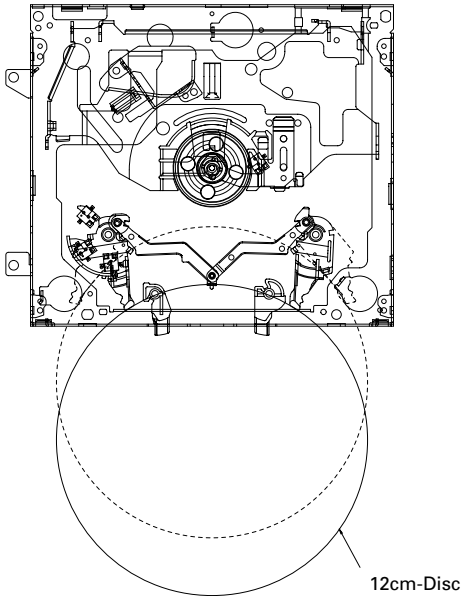
Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

● Loading actions

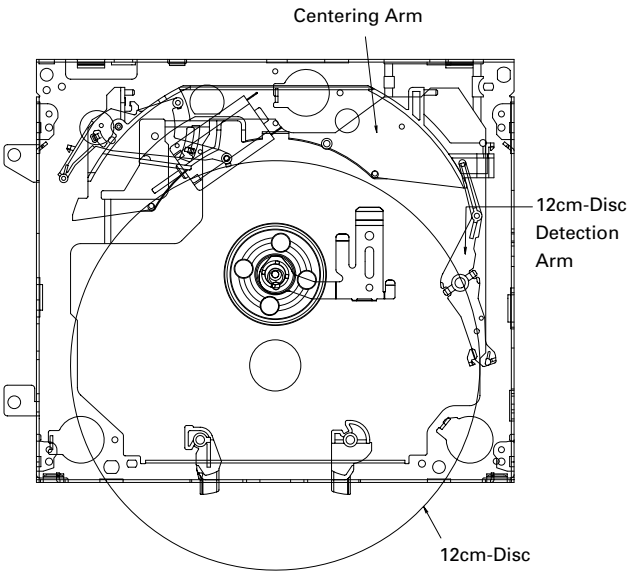
1. When a disc is inserted, SW Arm L and R rotate. Due to the rotation of Arm L, SW1 is switched from ON to OFF and the Load Carriage Motor starts.
2. If the disc is 12cm-disc, when it is carried to the position shown with the dotted line in the drawing, SW 3 switches to ON due to such rotation of Arm. Then, the microcomputer judges that the disc is 12cm-disc.
3. In case of 8cm-disc, the disc cannot reach such dotted line position, and from such limitation of approach, the microcomputer judges that the disc is 8cm-disc and simply triggers clamp actions.
   (Movement of SW Arm L and R are connected together. So, if pushing force is fed to only one arm, the distance between tow arms cannot be widened beyond the specific degree, because the coupling part is locked in such case.)

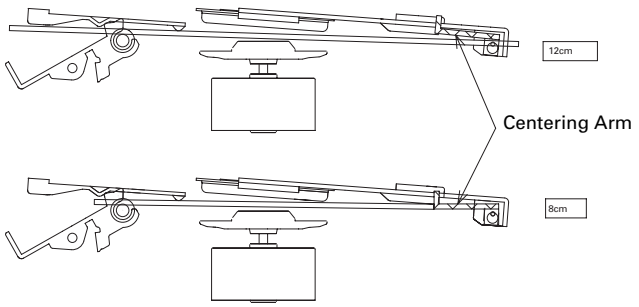




● Disc centering mechanism

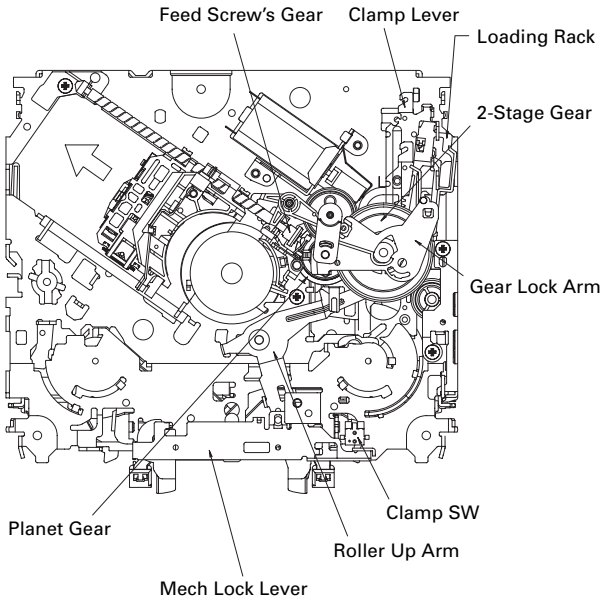
1. In case of 12cm-disc, the 12cm-Disc Detection Arm rotates, and with such rotation, it raises the Centering Arms to retreat the arms from disc's trace. The disc passes through under the arms, and at the inner part, it is centered.
2. In case of 8cm-disc, it is just centered at the position where its edge touches the front portion of the Centering Arm.

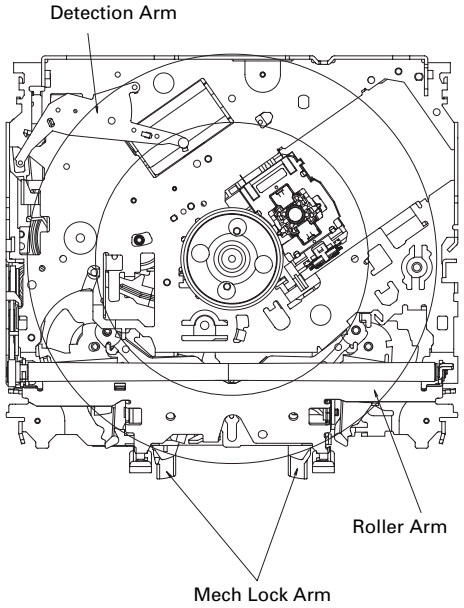




● Clamp actions

1. When an 8 or 12cm disc is placed on the center of the spindle, the detection arm starts moving.
2. The movement of the detection arm engages the loading rack with the 2-stage gear.
3. The clamp lever slides to lower the clamp arm. At this time, the roller up arm rotates to separate the roller arm from the disc. The roller arm moves the mech lock lever and turns the mech lock arm to release the mech lock. At the position where the clamp switch is turned off, the clamp operation ends.
4. After the clamp operation, the clamp lever moves to rotate the gear lock arm. The planet gear separates from the 2-stage gear to get engaged with the pickup feed screw's gear. Then the carriage operation will start.





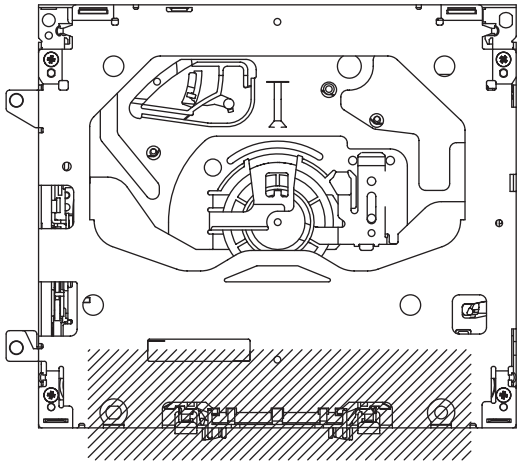
● Eject actions

1. Eject actions start when the Pickup is fed to the position inner than "Home SW ON" point in the internal circumference of the circle, caused by backward rotation of the Load Carriage Motor. Eject actions follow the foregoing procedures (steps taken in loading, centering and clamping actions), but each action in those steps is performed in reversed manner.
2. In case of 12cm-disc, Eject is completed when SW3 completes its condition- transition of OFF → ON → OFF.
3. For 8cm-disc, Eject is completed when SW2 completes its condition-transition of OFF → ON → OFF.

3. DISASSEMBLY

● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.

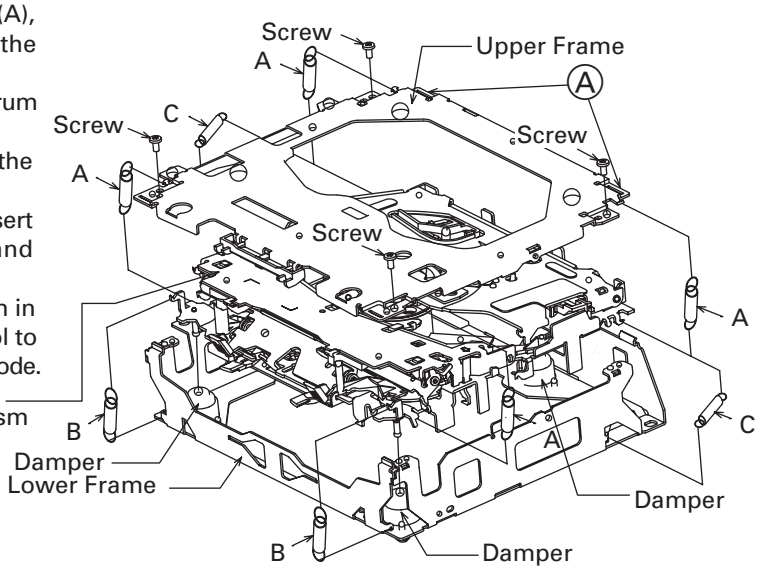


Do not squeeze.

● Removing the Upper and Lower Frames

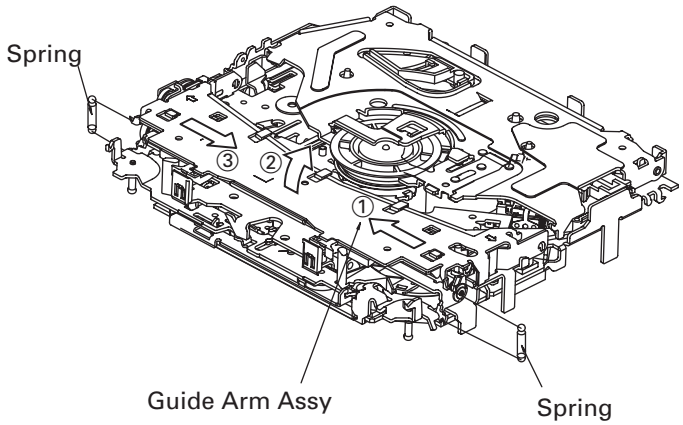
1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum Ⓐ.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the upper and lower frames removed, insert the connectors coming from the main unit and eject the disc.

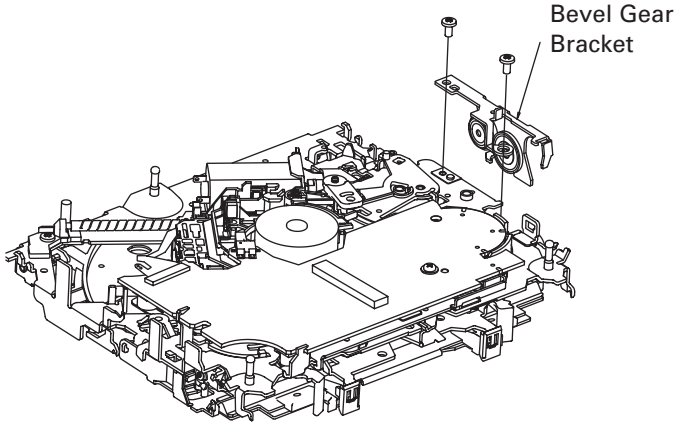
Caution: Before installing the carriage mechanism in the lower frame, be sure to apply some alcohol to dampers and set the mechanism to the clamp mode.



● Removing the Guide Arm Assy

1. Remove the upper and lower frames and set the mechanism to the clamp mode.
2. Remove the two springs.
3. Remove the two screws and bevel gear bracket. (See page 22.)
   Note that the gears come off.
4. Slide the guide arm assy in the direction marked with the arrow ① and open it upwards.
5. At the angle of about 45 degrees, slide the guide arm assy in the direction marked with the arrow ③ to remove it.

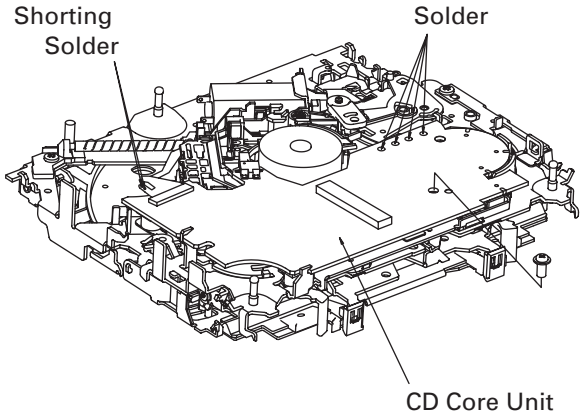




● Removing the CD Core Unit

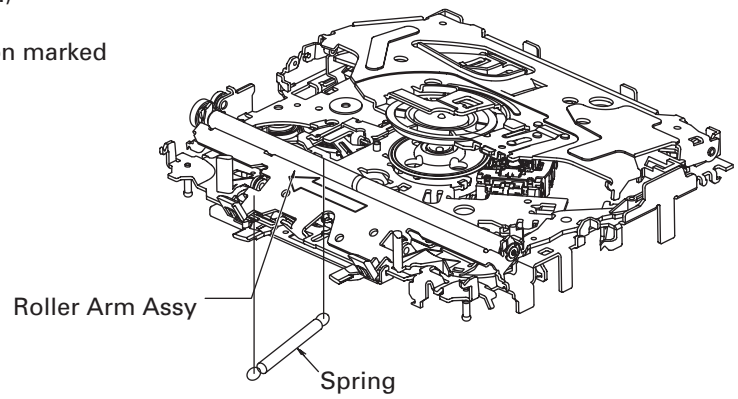
1. Apply shorting solder to the Pickup flexible cable. Disconnect the cable.
2. Remove the solder from the four leads, and loosen the screw.
3. Remove the CD core unit.

Caution: When assembling the CD core unit, set the mechanism to the clamp mode to protect the switches from any damage.



● Removing the Roller Arm Assy

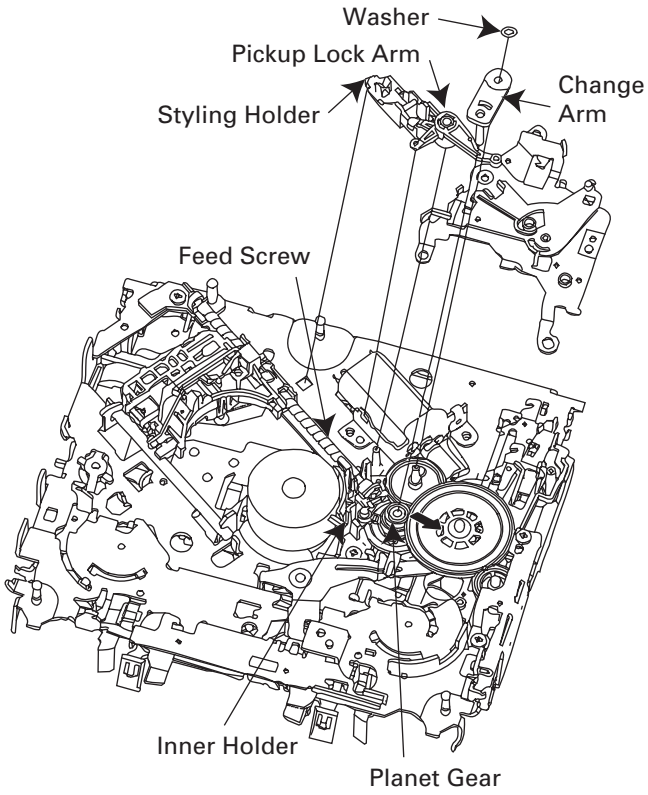
1. Remove the guide arm assy and set the mechanism to the eject mode.
2. Remove the CD core unit. (You do not have to remove the solder from the four leads.)
3. Remove the spring.
4. Slide the roller arm assy in the direction marked with an arrow.



● Removing the Pickup Unit

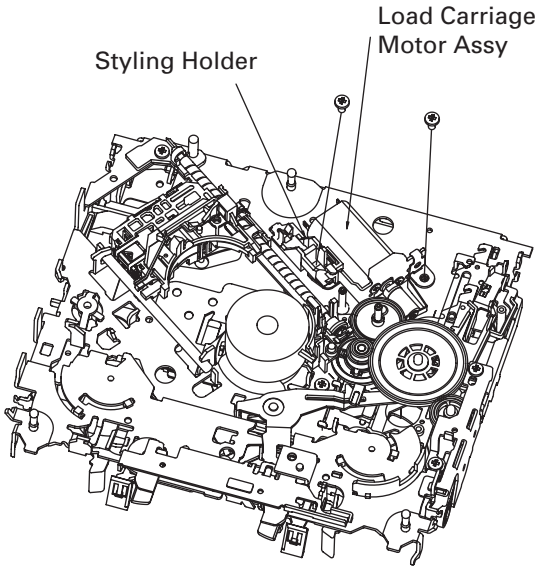
1. Set the mechanism to the clamp mode.
2. Remove the lead wires from the inner holder.
3. Remove the washer, styling holder, change arm, and pickup lock arm.
4. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



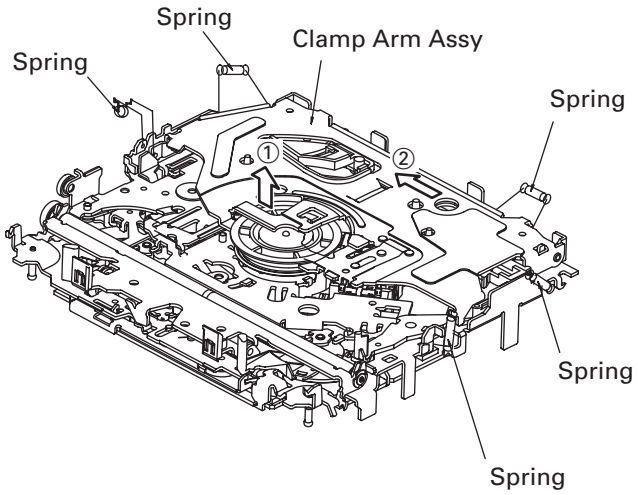
● Removing the Load Carriage Motor Assy

1. Release the leads from the styling holder and remove the holder.
2. Remove the two screws.
3. Remove the load carriage motor assy.



● Removing the Clamp Arm Assy

1. Remove the five springs.
2. While lifting the clamp arm assy, slide it in the direction marked with the arrow ② to remove it.



● Removing the Spindle Motor

1. Remove the two screws. Take off the spindle motor.